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EPIDEMIC CEREBRO-SPINAL MENINGITIS.

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CEREBRO-SPINAL MENINGITIS was first recognized as a definite disease by Vieussieu, in Geneva, in 1805. It is very probable that some of the epidemics in preceding centuries were cerebro-spinal meningitis; but, in the absence of definite clinical reports and the records of post-mortem examinations, it is impossible to be certain of this. The history of these early epidemics and the supposed identity of some of them with cerebro-spinal meningitis has been admirably treated in a paper by Dr. S. G. Webber. After Geneva, the next appearance of the disease was in Medfield, Massachusetts, in 1806, and it was described by Danielson and Mann in the *New England Medical and Agricultural Register*. In the same volume of this magazine there is a letter to the editor from Vincennes, Indiana, describing a virulent epidemic disease there which principally attacked young people, and the editor very pertinently asks if this might not be the same disease as that described by Danielson and Mann.

Apparently beginning in Medfield, Mass., the disease extended as an epidemic over the New England States and into Canada, Pennsylvania, and Maryland, and prevailed until 1816. There are two interesting descriptions of the disease in this period. Elisha North, Goshen, Conn., in 1811 published a small book on spotted fever, in which he not only

gave his own experience with the disease, but collected a number of descriptions, many of which had appeared in the newspapers. The other important article relating to this period is the report of a committee appointed by the Massachusetts Medical Society in 1809 to investigate the disease. The committee was composed of James Jackson, Thomas Welch, and J. C. Warren, and in the report there is an account of eight post-mortem examinations, most of which were made by Warren. Danielson and Mann had previously reported the results of four post-mortem examinations.

Hirsch, in his admirable description of the disease, divides it into four periods. The first from 1805 to 1830, in which the disease principally prevailed in the United States; the second from 1837 to 1850, in which it principally prevailed in France, and extended from France into Algiers; third, from 1855 to 1875, when it prevailed chiefly in Germany; and the fourth from 1875 to the present time, in which the disease appears to have been generally diffused, and has appeared in small epidemics in a great number of places.

From 1820, which marks the end of the first period of the epidemic prevalence in the United States, there was but little seen of the disease until 1849, when it prevailed in some troops stationed at New Orleans, and in small epidemics in various places in the South. More or less of it was seen in both armies during the civil war, and a good description is given by Upham, who observed an epidemic in the troops stationed at Newbern, N. C. At the same period the disease prevailed extensively at Philadelphia and in Boston. Since that time there has been a considerable epidemic in Boston in 1874; in Lanaconing, Md., in 1892, and in New York in 1893.

Considered as an epidemic, cerebro-spinal meningitis has many features which distinguish it from epidemics of other infectious diseases. As a rule, none of the epidemics have shown a continuous extension, this being noticeably the case with the first recognized epidemics. In the French epidemics from 1840 to 1845 it appeared in some cases to extend with the movement of troops, and was undoubtedly carried into Algiers in this period by the French troops. As a rule, the outbreaks of the disease have been seen as perfectly isolated epidemics in places which had been hitherto free from it. Almost all of the epidemics have appeared in the winter and spring. Woodward speaks of the disease in Litchfield County as appearing in the spring when the frost was being dissolved and the ground breaking up, and says the disease seemed to be more common in rainy weather. There are few exceptions to this rule. In a few places the disease appeared in the summer.

During the past winter and spring a small epidemic of the disease has prevailed in Boston. We have collected all of the cases which were seen in the Boston City Hospital, the Massachusetts General Hospital,

and the Children's Hospital from June, 1896, to October, 1897, and have found 111 cases. In 1896, 1 case appeared in June; 1 case in September; 3 cases in December; in 1897, 1 case in January; 10 in February; 23 in March; 29 in April; 21 in May; 14 in June; 7 in July; and 3 in September.

In general, the disease has been most prevalent in children and young adults.

Lichtenstern, in the epidemic in Cologne in 1885, found that only 23 of the 111 cases occurred after the thirtieth year. The ages given by Lichtenstern for his 111 cases are almost exactly the same as we have found in the same number of cases.

Some writers do not believe that the disease is contagious, and in going over the accounts of the epidemics we have found very little evidence for contagion; as a rule, but single cases have appeared in the same family and in the same house. A map of the city, giving the distribution of the single cases, shows them to be pretty well scattered over the city, there being only two localities where the cases were especially numerous.

In a question of the probability of the transmission of an infectious disease we must consider the location of the disease in the body, and the ways in which the organisms causing it can pass from the lesions of the disease to the outside; further, the viability of the organisms and the possibility of their leading a saprophytic existence.

The lesions of meningitis are chiefly in the meninges in the brain and cord, and in most cases confined there. In a certain number of cases there are lesions in the lungs, ears, and nose in which large numbers of organisms are present, and from which infection to neighboring objects or persons could easily take place. The organism, as far as we have been able to tell from its behavior on culture-media and in the tissues, has a feeble vitality, and would not be capable of leading a saprophytic existence. It must be remembered, however, that we cannot reproduce the conditions which organisms may find in nature. The organism increases in the affected individual, and, in a certain number of cases, may infect his surroundings, and may, in a manner which we do not know, be conveyed to the tissues of a susceptible individual, and there produce the disease. Why this takes place in some cases and not in others, and the conditions under which it takes place, we do not know.

There is but little in the literature bearing on the subject of immunity in this disease. We have been able to find but five cases in which the same individual is reported to have had the disease twice, and in one of these the second attack is to be considered a relapse and not a fresh infection. The mortality of the 111 cases was $68\frac{1}{2}$ per cent.

A great deal of interest attaches to the sporadic cases of cerebro-spinal meningitis. We can only be certain that these sporadic cases

represent the same disease as the epidemic form, when the same organism has been found in cultures. So far we have only been able to find one instance in which the diplococcus intracellularis, the organism of epidemic cerebro-spinal meningitis, was found in a sporadic case. In most of these cases no cultures have been made, but, so far as we can judge from the clinical and anatomical descriptions, many of these sporadic cases represent the true epidemic form. Almost all observers who have been acquainted with the epidemic form of the disease speak of the presence of sporadic cases occurring both before and after the epidemics. In the reports of the sporadic cases we think it may be generally assumed that the cases which recovered were of the epidemic form. So far we have not been able to find a case which certainly could be regarded from the accompanying pneumonia or endocarditis as pneumococcus meningitis which has recovered. In the same way there are no recoveries noted from cases of meningitis secondary to thrombosis of the lateral sinuses or disease of the middle ear, in which cases the streptococcus pyogenes is usually the infecting agent. This matter of the relation of sporadic cases to the epidemic form is one of great importance, and can only be determined by careful bacteriological examination of the organs of the cases which die, and bacteriological examination of the exudation obtained by spinal puncture in all cases. It seems probable that sporadic cases of epidemic cerebro-spinal meningitis constantly occur, and under conditions the nature of which we are not aware may so increase in number as to form an epidemic.

Nothing can be learned with regard to these cases from examination of mortality tables. One gets the impression from such tables that the disease is very frequently not recognized when it occurs, and that many cases are reported as meningitis which are not so. A large percentage of the cases of meningitis are reported in such tables as occurring in children under one year of age, whereas all forms of meningitis are extremely rare at this age. In our 111 cases there was but one case under one year.

The etiology of cerebro-spinal meningitis until recently has been involved in obscurity. The first description of an organism which might be considered as the diplococcus intracellularis was given by Lichtenstern in 1885. He found in the exudation in the meninges a few cocci, sometimes single, sometimes in groups similar in arrangement to gonococci, enclosed in white corpuscles. Schwabach found diplococci in the pus-cells in a case of otitis media secondary to meningitis.

The first definite description of the organism was given by Weichselbaum in 1887. The organism is described by him as a diplococcus which, in the lesions, is found almost solely within the cells. He found that it grew best on agar-agar, the pure cultures forming a white, rather viscid growth, and the single colonies often appearing to be

formed of small confluent masses. In cultures the organisms grow singly, in pairs, and in tetrads; both in cultures and in the tissue they are decolorized by the Gram stain. Weichselbaum inoculated mice, guinea-pigs, rabbits, and dogs with pure cultures of the organism. Subcutaneous inoculations were without result, but inoculations in the pleural or peritoneal cavities proved fatal in guinea-pigs and rabbits in from one to four days. In these serous membranes, inflammation with sero-fibrinous exudation was produced. He produced meningitis and encephalitis in dogs by inoculating them directly in the meninges. He called the organism the *diplococcus intracellularis meningitidis*.

There were few confirmations of the discovery of Weichselbaum until 1895. Jäger found the same organism in twelve cases of epidemic cerebro spinal meningitis occurring in the garrison at Stuttgart. His description of the organism agrees essentially with that of Weichselbaum, with the exception that he says a capsule was sometimes found around the organisms, and that cover-slips made from the cultures could be stained with Gram. Weichselbaum claimed that neither in cultures nor in the tissues would the organism take the Gram stain. Since then the organism has been generally found in the epidemics of the disease which have been investigated, and in one sporadic case.

In thirty-five of our cases on which post-mortem examinations were made, diplococci were found in cultures or on microscopic examination of the exudation or in microscopic sections of the tissues in all but four cases. In most of the cases they were found by all three methods of examination. In one case in which they were not found at the post-mortem examination they had previously been found in the fluid withdrawn by spinal puncture. Two of the other cases were very chronic, and no acute lesions were found. The fourth case was a chronic case with a mixed infection with tuberculosis. The diagnosis of the mixed infection of this case was made from the character of the lesions in the meninges and from the extension of the inflammatory exudation along the nerves without any evidence of tubercular lesions, although old tubercles were found in the meninges. In a certain number of cases cultures failed to give the organism, although they were abundantly present, as shown by cover-slip examination of the exudation in the meninges and microscopic sections. As showing the difficulty in growing the organisms in cultures made from the meninges at the post-mortem examination, ten cultures were made in one case from the exudation on the brain, and six from the cord, cover-slip examination showing abundant organisms in the cells. Only two of the cultures from the brain and one from the cord showed a growth, a single colony being found on each tube. In ten cultures from the brain and nine from the cord, in another case, but two tubes showed a growth. As a rule, the organisms were more easily obtained in cultures made in the acute

cases than in the chronic. In a few of the cases the culture-tubes showed a very abundant growth of the organism, so abundant that on casual inspection of the tube the growth might very well have been taken for the pneumococcus.

When grown in pure culture the diplococcus intracellularis of Weichselbaum has the following characteristics: It is of about the same size as the ordinary pathogenic micrococci, and appears in diplococcus form as two hemispheres separated by an unstained interval. It stains with any of the ordinary stains for bacteria and is decolorized by the Gram method of staining. There is considerable irregularity in staining, some organisms being brightly stained, others more faintly. Sometimes this difference in staining is seen in a single pair of organisms, one being more brightly stained than the other. There may also be considerable variation in size, the larger organisms staining imperfectly. In these swollen organisms there is often a brightly stained point in the centre, while the remainder of the cell is scarcely colored. This condition may have been mistaken by Jäger for a capsule around the organism. These variations in size and in staining appear to be due to degeneration, and are more common in old than in fresh cultures. Division usually takes place in one plane, giving rise to diplococci; tetrads are occasionally seen. There is little or no tendency to grow in the streptococcus form, although short chains of from four to six organisms may be found. We have never seen the streptococcus form described by Jäger, and in the short chains the longitudinal line on which he lays so much stress was not seen. In cultures the organism does not give a profuse growth on any media. We have found the blood-serum mixture of Löffler the best adapted for its growth. From its feeble growth on agar we are sure that had this medium been generally used for the first cultures, the organism in many instances would not have been found. In all cases a large number of organisms appeared to be dead, or at least they did not grow. Even when a large quantity of an exudation, which on microscopic examination contained large numbers of the organisms, was spread over the surface of a culture-tube, only single colonies developed. The same was true in transplanting colonies. In place of a streak, single colonies developed in the line of the needle. To be sure of obtaining growth it was necessary to make a number of cultures, using large amounts of the exudation. To keep pure cultures going, transfers were made daily, and four or five tubes inoculated. On the Löffler serum mixture the diplococcus forms round, whitish, shining, viscid-looking colonies, with smooth, sharply-defined outlines, and may attain a diameter of 1 to 1½ mm. in twenty-four hours. In acute cases, when large numbers of the organisms are present, there was in some cases an abundant growth of minute, round, transparent colonies bearing much resemblance to the pneumococcus lanceolatus. The growth is feeble on

plain agar, better on glycerin agar, though on neither so good as on blood-serum. In bouillon the growth is feeble and the media become only slightly cloudy. At the bottom of the test-tube there is a scanty, whitish sediment which rises up as a viscid string when the tube is shaken.

In the tissues the diplococcus is almost strictly confined to the interior of the polynuclear leucocytes. It was never found in the bodies of other cells. It has no definite position in the cell, and is never found in the nucleus. When smears of an exudation are made, appearances suggestive of this may be found, the result of distortion of the cells in making the preparation. The number of organisms found in the cells varied from a single pair to cells so closely packed with them that the nucleus was obscured. In no case were the diplococci found except in connection with the lesions of the disease. So far as could be learned from cultures of the blood, liver, spleen, and kidneys the organism never produces septicæmia. Mixed infections with other organisms were not uncommon. The pneumococcus was found seven times in connection with the diplococcus intracellularis and once Friedländer's bacillus was found. Terminal infections with staphylococci and streptococci were occasionally found. The results of inoculations are confirmatory of previous experiments. The organism has very feeble pathogenic powers, even when injected into the pleural and peritoneal cavities of rabbits and guinea-pigs. In a small percentage of cases death was produced in from twenty-four to forty-eight hours, and a slight fibrino-purulent exudation was found in the membranes. Typical meningitis was produced in a goat by inoculating directly into the spinal canal. The animal died within twelve hours, and at the post-mortem examination a slight fibrino-purulent exudation was found in the meninges of both the brain and cord.

Lumbar puncture was performed in fifty-five cases, and in a few cases several punctures were made in the same individual. In the fluid obtained the diplococci were found on microscopic examination or in cultures in thirty-eight cases. In seventeen of the cases they were absent. The average duration of time from the onset of disease before spinal puncture was made was seven days in the positive cases, and seventeen days in the negative cases. The longest time after onset in which a positive result was obtained was twenty-nine days. The negative cases were most numerous in the early part of the epidemic before we had realized how difficult it was to obtain cultures of the diplococcus in all cases. In one case in which cultures were made by pouring 1 cc. of the fluid obtained over the slanting surface of the culture media, on one tube one colony developed, three on a second, and none on four others. In another case fifteen tubes were inoculated with the fluid. On two of the tubes there were two, and on one ten colonies of the

organism; twelve tubes remained sterile. In this case microscopic examination of the fluid showed considerable numbers of diplococci in pus-cells.

The character of the fluid obtained by spinal puncture varied greatly. In some cases, even when diplococci were found in it, it was almost clear, showing only a slight turbidity when held against a dark background. In most of the cases where the puncture was made early in the disease the fluid was turbid, in some almost like pus, and in twenty-four hours a large sediment formed at the bottom of the tube. The amount of fibrin which formed in the fluid varied.

Interesting results were obtained in those cases in which several spinal punctures were made in the course of the disease. In these cases there was a diminution in turbidity, often accompanied by the absence of organisms in the fluid last withdrawn. In one chronic case, of a marked intermittent character, three punctures were made, one before, one after, and one during an exacerbation. In the fluid obtained by puncture before and after the exacerbation no diplococci were found. The fluid obtained during the exacerbation was more cloudy and contained diplococci. In the fluid obtained in early punctures two or three days after the onset of the disease, almost the only cellular elements were the polynuclear leucocytes. Later the large epithelioid cells of the meninges were found among the pus-cells, often enclosing them. A small number of lymphoid cells were found in many cases, and were numerous in the chronic cases. No ill effects were seen from spinal puncture. Dr. Williams believes that the withdrawal of the exudation may be of positive benefit to the patient. A note in the history of one case says the patient became much quieter and slept after the operation. Too much cannot be said of the importance of the procedure in making the diagnosis of the disease. There should always be a microscopical and bacteriological examination of the fluid obtained in order to ascertain what organism is present. Acute meningitis may be due to a variety of organisms, and it is important to know which is present. This knowledge is certainly useful in making the prognosis, and in the future it may be of importance in the treatment.

The pathological anatomy of acute cerebro-spinal meningitis first began to be carefully studied in the French epidemics from 1840 to 1845. The most careful study of the lesions of the disease has been made by the Germans in the epidemics which have prevailed in various places in Germany from 1865 up to the present time.

We have carefully studied the lesions in the tissues in the thirty-five post-mortem examinations made during the epidemic. In most cases post-mortem examinations were made but a short while after death. When the period was longer most of the bodies had been kept, preceding the examination, in a room cooled by a freezing process to from 32°

to 35° F. At every post-mortem examination where it was possible cultures were made from the brain, cord, heart, lungs, liver, kidneys, and spleen. For general histological purposes, portions of the brain, cord, and other organs were hardened both in Zenker's fluid and in alcohol. For the study of nerve degeneration small pieces of tissues were hardened in Müller's fluid or in formaldehyde, followed by Müller's fluid, before staining in Marchi's solution.

For the study of the distribution of the diplococcus and of the histological changes in the tissues, eosin followed by Unna's alkaline methylene-blue solution was found to give by far the most satisfactory stain. The advantage of Unna's solution, which is more alkaline than Löffler's, is that it stains bacteria and nuclei in tissues hardened in Zenker's fluid, which gives a much more perfect fixation of the tissue elements than either alcohol or sublimate. The tissues were almost exclusively embedded in paraffin. The crystals of corrosive sublimate were removed from the sections after cutting so as to avoid prolonged treatment with iodine, which acts injuriously.

In the cases on which post-mortem examinations were made the duration of illness varied from two days up to seventy-four days. The average duration, leaving out of consideration the very chronic case of seventy-four days, was eleven and one-third days; the time not being taken from the stay of the patient in the hospital, but from the initial symptoms of the disease. The duration was really much less than this for the average number of cases, being greatly increased by seven cases, which were twenty-three, thirty-two, twenty-three, thirty-seven, twenty-nine, thirty, and twenty-six days, respectively. Leaving out these and the seventy-four day case, the average duration was six and one-half days, which can be taken as the average length of time of the acute cases, while twenty-eight and a half days can be considered as an average of the chronic cases, here again leaving out the exceptional case of seventy-four days.

The condition of the body varied in the acute and chronic cases. In the acute cases the body was generally well nourished, and in some there was an abundant development of adipose tissue. The chronic cases presented an almost characteristic appearance; the body being greatly emaciated, the skin pale, the abdomen sunken, and the muscles thin and pale. In one case, which was of six days' duration, there was a decubitus over the sacrum. Evidences of herpes and other skin lesions were not as apparent on post-mortem examination as they were during life. In one case there was a perfectly characteristic hemorrhagic eruption over various parts of the body.

Lesions of the nervous system. The lesions produced by the disease may be divided into those affecting the meninges, those affecting the tissues of the brain and cord, and those affecting the cerebral and spinal

nerves. The pathological process in the meninges consists in inflammation with purulent, sero-purulent, and fibrino-purulent exudation. The most marked lesions were found at the base of the brain, extending from the optic commissure backward over the crura, the pons, and the medulla. The meninges of the entire brain area were rarely affected. In the most acute cases, in those dying within two or three days from the onset, the conditions were not so marked as in the more prolonged cases. In these very acute cases there was but little exudation. The bloodvessels of the pia-arachnoid were intensely injected, the large bloodvessels appearing as red lines, and the entire surface of the brain had a pinkish hue, due to injection of the smaller vessels. The exudation appeared in yellowish lines in the sulci along the vessels, and in some cases there was but slight cloudiness. In the more advanced cases, those dying from five to twelve days from the onset, the amount of exudation was much greater, and it contained more fibrin. In the chronic cases in which death took place in from fifteen to thirty days from the acute onset, the appearance of the meninges differed widely from that in the acute. The most marked change was œdema and general thickening of the meninges. There was but little evident exudation, yellowish circumscribed foci scattered here and there in the sulci marking the remains of it. The meninges at the base were opaque, enormously thickened, and there were bands of organized tissue extending from point to point. The inflammation was confined to the pia-arachnoid. The adjoining surface of the dura was smooth, and the vessels were but little injected save in the dura of the cord. There were few lesions in the tissue of the brain and cord apparent to the naked eye, and, without careful microscopic examination, lesions, which must be regarded as among the most important of the disease, would have been overlooked. These lesions of the brain and cord were less marked in the most acute cases. In the more advanced cases the surface of the ventricles had lost its glistening appearance. It was softer, sometimes almost mushy to the touch, and small losses of substance or a more or less ragged or uneven condition of the surfaces were found. The general consistency of the brain was but little altered. It may be somewhat softer to the touch, owing to the dilatation of the ventricles, and there may be œdema. Foci of softening and of hemorrhage were found in the tissues of the brain, but there was no definite abscess formation. The cranial nerves were affected to a greater or less degree in all cases. Those most affected were the second, fifth, seventh, and eighth. The Gasserian ganglia were removed in a number of cases, and in all they were found swollen and softened.

The results of the microscopic examination of the tissues differ according to the acuteness of the process. In the most acute cases, in which there was but slight change to the naked eye, the lesions consisted in purulent infiltration of the meninges. The leucocytes in the exudation

were almost exclusively polynuclear. In some places they were closely packed together; in others they were found scattered in a finely granular mass which evidently represented a coagulated albuminous exudation. No eosinophile cells were found in the exudation. In more advanced cases the number of cells was much greater, and they appeared in large masses in the meshes of the tissue. Many of these cells, particularly those in the middle of the masses, were swollen and granular, and the nuclei either stained imperfectly or not at all. There was more fibrin than in the more acute cases. It appeared in masses by itself, or as a delicate network among the pus-cells. In one case it had undergone hyaline metamorphosis in places. It was never present to the same extent as in other forms of meningitis, particularly that produced by the pneumococcus. In addition to the leucocytes there were large cells from two to eight times the diameter of a leucocyte. They were present to some extent in all cases, but very few were found in those most acute. The nuclei of these cells were large and vesicular; the protoplasm stained very faintly and was finely granular. It was difficult to make out the protoplasm of these cells, for they were filled with other cells which they had taken up. Polynuclear leucocytes, often in considerable numbers, were found in these cells. The enclosed leucocytes were most often in a vacuole in the large cell, and a clear space could be seen around the periphery of the enclosed cell. The protoplasm of these enclosed cells gradually disappears, the nucleus breaks up into irregular masses of chromatin, and some large cells were found filled with irregular chromatin fragments. The formation of these large cells from the cells of the connective tissue and from those lining the lymph spaces in the tissue could easily be followed. Numerous nuclear figures were found in such cells. In the chronic cases the exudation was of much slighter extent. The meninges were converted into thick, dense masses of tissue resembling cicatricial tissue containing but few cells. In the place of the abundant exudation in the acute cases, masses of degenerated pus-cells and nuclear detritus were found. In various places there were collections of lymphoid and plasma cells around the vessels. The lesions in the tissue of the brain and cord were interesting on account of their frequency, their general bearing on pathological processes, and from being most marked in the particular form of meningitis which is produced by the diplococcus intracellularis. The lesions were most evident in those cases in which from five to ten days elapsed from the onset of the disease until death. In places there was a circumscribed infiltration of the tissue with pus-cells which extended downward from the infiltration in the meninges. The spaces around the dilated vessels were often filled with pus-cells which extended from here into the surrounding brain tissue. In addition to the infiltration around the vessels, single pus-cells were found in the brain tissue, apparently remote from the areas of infiltration. In two cases there was extensive

softening, with purulent infiltration and hemorrhage in the cortex of the cerebellum. In these places the cortex was represented by granular masses scattered among the pus-cells and hemorrhage, and the cells of Purkinje had disappeared or only granular fragments representing them were found. The areas in the white matter which showed macroscopically as hemorrhages, under the microscope appeared as foci of fine hemorrhages with but little infiltration with pus-cells. In one case there was an acute focus of softening with purulent infiltration in the pons just over a thrombus in the basilar artery. In this area the tissue was distinctly broken down, necrotic, and infiltrated with pus. In several of the chronic cases in which there were marked thickening and cellular infiltration of the meninges, the same cellular infiltration was found around the vessels extending into the tissue.

The most interesting changes in the brain concern the neuroglia. The most marked changes were found in the cortex beneath the ventricles and in the neighborhood of the foci of softening. With a low power there was a distinct increase in the cells of the cortex outside of the ganglion cells. The neuroglia cells were swollen; their nuclei were large, clear, vesicular, and contained much chromatin. Around these large nuclei there was a faintly stained irregular mass of granular protoplasm. Many of the cells contained two nuclei, and in places there were groups of four or more nuclei closely clustered together, with a considerable amount of protoplasm around them. In all of these places numbers of nuclear figures were found. They presented the same forms as other multiplying nuclei, and in some cases the spindles and centrosomes were distinct.

For the recognition of these nuclear figures much depends either on the condition of the tissue or the period of the disease. They were numerous in some specimens, while in others in which there was evident proliferation they could be found only after prolonged search. In some of the places where the proliferation was most marked there was some infiltration of the tissue with pus-cells; in others the nuclear figures were found at a distance from such infiltrations and in apparently normal tissues. The greatest increase in the neuroglia was found around the foci of hemorrhage and cellular infiltration in the white matter. In every case proliferative changes in the neuroglia were found in the tissues adjoining the ventricles. Even where the ependymal lining was preserved the cells were closely packed together, the nuclei were large, and proliferation had evidently taken place, but no definite nuclear figures were found.

Marked changes in the neuroglia of the cord were found in but one case. In this the changes were most evident in the gray matter of the cord. These neuroglia changes were accompanied by changes in the connective tissue. The cells of the bloodvessels were swollen, in-

creased in number, and nuclear figures were found in them. In the same field nuclear figures were often found in the neuroglia cells and in the cells around bloodvessels. In the small hemorrhagic foci the walls of the vessels were often found infiltrated with large epithelioid cells, together with lymphoid and plasma cells. A definite formation of connective tissue proceeding from this proliferation around the vessels was not found, save in one chronic case, and in this the process had advanced so far that the steps in the formation of connective tissue could not be followed.

Examination of the ganglion cells showed slight changes in these. These changes consisted in an alteration of the cell granules, accompanied with irregularity in shape, and often atrophy of the body of the cell. In some of the sections which were hardened in Fleming's solution, and in some hardened in Müller's fluid, and subsequently treated by Marchi's method for degeneration, fatty degeneration was found in the cell protoplasm. Diplococci were found in variable numbers in the meninges in the brain and cord, and were less numerous in the cord. They were always most numerous in the acute cases where the exudation was composed almost wholly of pus-cells. Variable numbers were found in the single cells, but cells wholly filled with them, which were so common in the alveoli of the lungs, were rarely found.

The most marked lesions in the nerves were found in the second, sixth, and eighth. Lesions of the optic nerves were due to an extension of the inflammatory process from the meninges. The subdural space of the nerve was dilated, but usually contained no cellular exudation. Just as in the brain, the purulent exudation was found in the pia-arachnoid of the nerve. This was infiltrated with pus, and there were masses of pus-cells in the membrane, chiefly around the retinal artery after this had entered into the nerve sheath. In a longitudinal section of the nerve involving the retina the infiltration could be followed from the meninges of the nerve into the eye. In acute cases the cells in the meninges of the nerves and extending between the nerve bundles were polynuclear leucocytes. In more chronic cases along with the pus-cells there were numerous large epithelioid cells similar to those found in the meninges of the brain. Changes similar to those in the optic nerve were found in the olfactory nerve and the bulb, but the cellular infiltration between the nerve bundles was not so marked in this as in the optic nerve. In both optic and olfactory nerve proliferative changes in the neuroglia, similar to those described in the brain, were found. Sections of the eighth nerve in acute cases showed this to be embedded in a mass of pus, the nerve-sheath softened, broken up, and in places entirely lost. The nerve itself was infiltrated with pus-cells, partly in the form of longitudinal lines, partly as a more diffuse infiltration. In the more chronic cases there were fewer pus-cells, and in place of them lines of

epithelioid and plasma cells. The seventh nerve frequently showed as great a degree of infiltration as the eighth. Some infiltration was also found along the third and sixth nerves, but it was not so marked. The fourth nerve was examined in but one case, and showed no infiltration. Longitudinal sections of the fifth nerve, involving the ganglion and some of its branches, showed an intense neuritis on the cerebral side of the ganglion. The single bundles of fibres were widely separated from one another, and between them there was considerable exudation in which there were numbers of pus-cells and epithelioid cells.

Sections of the nerve-roots of the spinal cord showed these affected in every case examined. As a rule, the greatest degree of affection of the nerve-roots was found in that part of the cord where the cellular infiltration was greatest, although in some cases a considerable degree of involvement of the nerve-roots was found with but little cellular infiltration of the meninges. Even in the most acute cases these changes in the nerve-roots of the cord were accompanied by proliferative changes in the peri- and endoneurium. The cells of the bloodvessels were swollen, increased in number, and around the bloodvessels along with the pus-cells there were numbers of large epithelioid and plasma cells. Lymphoid cells were comparatively few in number. The greatest amount of nerve-degeneration, as shown by the Marchi method, was found in the optic nerve in one case, and in the eighth nerve in another. In every case degeneration was found in the spinal nerve-roots and was more marked in the posterior than in the anterior nerve-roots. A minor degree of degeneration was found in the nerves of the cauda equina and in the popliteal nerves. In one of the cases a section treated for degeneration was made through the nerves and muscles of the orbit. All showed more or less marked degenerative changes, the optic and the sixth nerve being most affected. The ocular muscles in the section showed advanced fatty degeneration.

In five cases sections were made of the Gasserian ganglia, and of the spinal ganglia in two cases. In the acute cases the Gasserian ganglia were infiltrated with pus, and masses of ganglion cells were found separated from their connection. Single ganglion cells were found lying free in the exudation. Various degrees of degeneration and even complete destruction of these cells was often found. The spinal ganglia were not affected to the same extent as the Gasserian. All seemed to be somewhat swollen and œdematous, but in some this condition was much more marked than in others. The bloodvessels were injected, the ganglia infiltrated with pus. Sections of the ganglia, including longitudinal section of the nerve-roots in connection with it, showed these to be infiltrated with pus. The rapidity with which these changes in the ganglia can take place was shown in a section of the spinal ganglia of a goat which died not later than twelve hours after inoculation in the

spinal canal. In one of the ganglia examined there was a beginning purulent infiltration.

Sections of the eye were examined in two cases, in one of which choroïditis, cloudiness of the cornea, and conjunctivitis were found during life. There was a purulent infiltration of the eye extending from the optic nerve. All of the vessels of the choroid were intensely injected, but there were few hemorrhages and no purulent infiltration. The retina on either side of the optic nerve was broken up and infiltrated with pus. The vitreus was filled with a large amount of pus, made up entirely of polynuclear leucocytes. None of them contained eosinophile granules. The largest mass of this pus was adherent to the iris and retina. The anterior chamber contained a large amount of pus. The tissue of the iris was œdematous and infiltrated with pus-cells. No evidence of proliferation was seen in any of the pigmented cells of the iris or ciliary region. Sections passing through the cornea showed the fibres of this separated, and the tissue contained a great amount of pus-cells lying in the corneal spaces. Diplococci were found in large numbers in the pus-cells in the vitreus and anterior chamber.

The condition of the lung is interesting on account of the relation which has very generally been supposed to exist between epidemic cerebro-spinal meningitis and pneumonia. In thirteen cases there was merely congestion with more or less œdema. In seven cases there was broncho-pneumonia, more marked in the lower posterior portion of the lung. In two cases there was characteristic croupous pneumonia; one in the stage of red hepatization bordering on gray. Pneumococci were found in these cases in cultures and on microscopic examination. In eight cases pneumonia due to the diplococcus intracellularis was found. Nearly all of these cases came from the last part of the epidemic. It is very possible that some of the earlier cases in which the lesions were described simply as broncho-pneumonia were really due to the diplococcus intracellularis. The lung lesions consisted macroscopically of areas of consolidation in various parts of the lung, more particularly in the lower lobe, and they were most numerous beneath the pleural surface. The foci varied in size from a pin's head up to that of a pea, and on section some of them resembled small hemorrhages in the tissue.

In other cases the periphery of the area was distinctly hemorrhagic and the centre opaque and yellowish. In one case the consolidation of the lung was so extensive that it might easily have been regarded as croupous pneumonia, particularly as the pleura over it was covered with a definite fibrinous exudation.

On section, this large area was composed of a number of irregular grayish foci, with softened centres and with hemorrhagic and œdematous tissue between them. The lung tissue in the yellowish centres was frequently broken down, and pus oozed from this. On microscopical exam-

ination the central areas showed in most cases a purulent infiltration of the tissue with beginning abscess formation. The alveoli contained large numbers of pus-cells; their walls were infiltrated with pus and in places entirely broken down. The foci of consolidation did not appear to be bronchial in origin. The bronchi in the vicinity often contained pus-cells, but their walls were not infiltrated.

The duration of the disease in the cases in which diplococcus pneumoniae was found was: in two cases, three days; in two cases, two days; in two cases, fifteen days; in one case, nine days; in one case, twenty-three days, and in one case, seventy-four days. It will be seen from this that the lung complications due to the pneumococcus can take place in almost any period of the disease. In the case of seventy-four days' duration, the lesion in the brain and cord could be regarded as almost completely healed, and the lesions in the lungs were acute. In one case in which, from the history as given by the relatives, the disease was only two days in duration the lesions in the lungs were so advanced that they seemed possibly to antedate those of the brain, providing the history as given by the patient's relatives was correct. Immense numbers of diplococci were found in the pus-cells in the lung. They were most numerous in the cells in the centres of the foci where softening was taking place. In the centre of one of the foci a small branch of the pulmonary artery was found occluded by a thrombus formed of pus-cells containing large numbers of diplococci. It seems probable that this thrombus may have come as an embolus from the meninges, and may have produced an infection of the surrounding tissue.

There was great variation in the size of the spleen. In general it was not much enlarged, and was probably smaller than in most of the acute infectious diseases. In only three cases was it found considerably enlarged. The average weight in the adult cases was 163 gms. The lymphatic glands in the uncomplicated cases were never found enlarged.

The liver presented no change beyond acute degeneration. In two cases extensive acute lesions were found in the kidneys. In one of these the kidney lesions had no connection with the meningitis, but were due to an accompanying infection with diphtheria. In the other case there was an acute hemorrhagic nephritis. In this there was an accompanying acute pericarditis, the organism causing which could not be ascertained. The only lesions found in the kidney which could be properly attributed to the meningitis were acute degenerative lesions which were always present.

The intestinal canal was found normal in every case.

In two cases there was acute pericarditis accompanied in one case with foci of necrosis and purulent infiltration of the myocardium. In several other cases in which the myocardium was examined histologically it was found normal.

Lesions of the skin were found in but one of the cases on which post-mortem examination was made. In this case over the upper and lower extremities, chest, and abdomen, there were numerous small dark purplish spots in the skin, varying in size from a pin's head up to that of a pea. On microscopic examination of these areas there was intense congestion and dilatation of the bloodvessels of the skin, with small and diffuse hemorrhages immediately beneath the epithelium. In some of the larger areas there was some purulent infiltration in the centre. No diplococci were found in these lesions.

With a view of ascertaining the frequency, together with the clinical and anatomical features, of cerebro-spinal meningitis due to other organisms than the diplococcus intracellularis, we have collected a number of cases from the reports of the laboratory for the past five years. Most of these cases come from the Boston City Hospital, but a number of them are from private post-mortem examinations, and the bacteriologic and histological examinations were made at the Sears Pathological Laboratory of the Harvard Medical School.

We have found meningitis apart from the epidemic form to be most commonly caused by the tubercle bacillus, the pneumococcus, and the streptococcus. In one case, the entire history of which is very imperfect, there was a mixed infection with the bacillus pyocyaneus and the staphylococcus aureus, and in another case the infection was due to the anthrax bacillus. In most of these cases the meningitis was secondary to infection elsewhere, which fact complicates the clinical history relating to the meningeal symptoms. In ten cases the pneumococcus was found and so associated with the lesions of the disease that it can certainly be regarded as primary. In eight of these cases the meningitis was secondary. In two there was fracture of the base of the skull extending across the temporal bone, the organisms evidently gaining entrance into the meninges from the middle ear. In one there was otitis media with necrosis of the bone, and pneumococci were found in both the pus from the ear and in the meninges. In three the meningitis was secondary to acute croupous pneumonia, and in one to acute fibrinous pericarditis. In one case there was broncho-pneumonia and thrombosis of the longitudinal sinus. In two the thickening of the meninges was primary. No other lesions due to the organism have been found in the body.

The records of the post-mortem examinations show some difference in the amount and distribution of the exudation in the meninges. In one case secondary to acute croupous pneumonia there was only a slight purulent fibrinous exudation over the base of the brain, extending a short distance over the lateral convexity on each side. In another case there was an extensive exudation over the base and over almost the entire surface of the brain. The exudation was usually confined

to the meshes of the pia-arachnoid, but in one case it is said to have been both in the membranes and on the surface. The microscopic examination showed considerable difference in the lesions here as compared with the epidemic form. There is a large amount of fibrin present in the exudation. The large cells enclosing numbers of leucocytes which were so prominent in the exudation in the epidemic meningitis were generally absent.

The most marked feature in both the pneumococcus and streptococcus meningitis is the acute endarteritis. The condition is similar in kind to the vascular lesions which have been described in tuberculosis of the meninges. The condition of the circulation in the vessels which were affected could not be ascertained.

In many of them there seemed no other change than an acute inflammation of the wall. In some the lumen was filled with cells, chiefly leucocytes, and in others there was a mass of fibrin and red blood-corpuses. The inflammatory change consisted essentially in an accumulation of cells between the endothelium, which was generally elevated in festoons, and the elastic lamina. In some places these cell accumulations were so great as to occlude the lumen of the vessel, and in others so slight that they might escape notice. The new cells were principally polynuclear leucocytes, but among them were seen larger cells of an epithelioid character. It was not possible to ascertain the origin of the larger cells in the specimen we have. The muscular coat in most cases was unchanged; in others it was partially invaded by leucocytes.

The clinical history of the eight cases in which meningitis was secondary to other conditions did not throw a great deal of light on the symptoms to be attributed to the meningitis. The symptoms referable to this were complicated with symptoms due to other lesions. Vomiting was found in but four cases. Delirium was less common than in the epidemic cases, and in four cases there was unconsciousness. In one of the cases of pneumonia in which there was an extensive exudation in the meninges there was nothing in the symptoms to point to this.

In general, it may be said that the difference between the clinical history of pneumococcus meningitis as compared with the epidemic form is in the absence or slight development of symptoms in the pneumococcus form which pointed to extensive infection of the meninges of the cord and spinal roots, and extension of the infection along the cranial nerves. At the same time it must be remarked that our observations are not sufficiently numerous to make any extensive generalizations.

In two cases the meningitis was primary. In one case, a well-nourished and well-built child of ten months, the disease began with restlessness, high fever, and vomiting, and the temperature continued high until

death, three days after the onset. The other case was that of a child who was taken when six days old with general clonic convulsions, accompanied by a temperature of 104° in the first twelve hours, which afterward dropped to 102° . Death occurred on the second day.

There were eight cases of meningitis due to the streptococcus, and in all the meningitis was secondary to infection elsewhere. In four cases the primary infection was in the ear, and in two of these there was thrombosis of the lateral sinus. In one the meningitis represented an extension to the meninges of erysipelas of the face and scalp. In one case there was acute endocarditis, and in one the meningitis was secondary to an alveolar abscess. One case was of especial interest in showing an infection which doubtless took place from the nose. In this case there was a fracture of the base of the skull extending across the cribriform plate of the ethmoid bone. Pus-cells and streptococci were found in the nose.

In all these cases the lesions in the meninges were very similar to those found in the pneumococcus infection. The exudation was purulent, with a very variable amount of fibrin, usually not so much as in the pneumococcus cases. The acute endarteritis was well marked, and there was no extension of the process into the brain.

The clinical histories of these cases of the streptococcus meningitis do not show anything of especial importance. Opisthotonos was found in but one case, and was not well marked. Pain and stiffness of the neck were found in two cases.

Symptoms referable to the eyes were noted in three cases.

There was one case of meningitis due to the anthrax bacillus. The case was that of a man, about forty years of age, who was a teamster engaged in handling hides. He had a carbuncle on the neck, which was removed by operation. Infection of the alimentary canal probably took place through the instrumentality of his fingers, which he was constantly putting into his mouth to feel an inflamed tooth. At the post-mortem examination there were thirteen carbuncles at various places in the intestinal canal, and an acute hemorrhagic meningitis with focal hemorrhages throughout the brain. The exudation in the meninges was distinctly hemorrhagic, and numerous anthrax bacilli were found in the tissue.

There is no doubt that acute meningitis may be produced by the entrance into the meninges of a number of infectious organisms. These forms are rarely primary. The organisms enter the meninges either by the formation of a communication between the meninges and some cavity where they may be accidentally present (as in the middle ear or nose), or by the extension to the meninges of an infectious process in the vicinity (mastoiditis, erysipelas), or they are brought to the meninges by the blood from some other focus in the body (pneumonia, endocar-

ditis). In tuberculous meningitis we have never found a single case in which the lesions in the meninges could be regarded as primary. The only two cases of apparently primary infection were in the two pneumococcus cases noted, and in one of these the infection may have come from the intestinal canal. We believe that all infections of the meninges other than the diplococcus intracellularis are fatal, but this can only be determined by microscopic and bacteriological examination of the exudation obtained during life by spinal puncture. If tubercle bacilli, pneumococci or streptococci are found with the evidences of meningitis in a case which recovers, it would settle the point; clinical evidence without lumbar puncture will not.

IMPLANTATION OF THE URETERS INTO THE RECTUM IN
EXSTROPHY OF THE BLADDER, WITH A DESCRIPTION
OF A NEW METHOD OF OPERATION.¹

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THE UNSATISFACTORY character of the results following operations designed for the restoration of the anterior bladder wall in exstrophy of that organ has led surgeons to abandon these procedures. Among the most successful of the flap-operations is that introduced by Dr. Daniel Ayres, the immediate result, when the operation is finally accomplished, being to close the defect with skin-flaps in two layers, the cutaneous surface of one of which is directed toward the mucous membrane of the posterior wall of the bladder, the expectation being that this would finally perform the function, to a greater or less extent, of the normal lining of the bladder-wall. The final outcome of these attempts, in my experience, has been far from satisfactory. The growth of hair upon the vesical surface of the skin-flap which forms the anterior bladder-wall leads to the formation of calculous material and the necessity for further and repeated operative interference.

The constant flow of urine, despite every effort to divert this to an artificial channel opening upon the perineum frequently negatives efforts to obtain healing, whether these are directed toward remedying the defect by simple flap operations of the Ayres type or closure of the accompanying gap in the pubic symphysis, after the manner of Trendelenburg.

Trendelenburg's operation consists of a separation of the sacro-iliac articulation, in order to correct the pelvic bony fissure, and a direct

¹ Read before the Brooklyn Surgical Society, November 4, 1897.

suturing, after preliminary freshening of the edges, of the defect in the soft parts. König and Küster modified the procedure by substituting osteotomy of the anterior pelvic ring for forced separation of the sacroiliac junction.¹ These procedures, as acknowledged by their originators, are exceedingly difficult of execution, and the resulting wounds are especially liable to become infected. Passavant proposed to accomplish closure of the pelvic bony gap by the application of "brisement forcé" under an anæsthetic. C. T. A. Koch, of Gronigen (Netherlands) succeeded in carrying out Passavant's proposition in a child of six years, the defect in the soft parts being closed by suturing the edges of the latter six weeks later. The case was reported one week following the second operation.²

In one of the most recent communications upon the subject, that of Tietze, of Mikulicz's clinic, all attempts to close the bony defect are abandoned, and the method of closure by lateral flaps is advocated.³

Even when the exstrophy of the bladder and the accompanying epispadias have been corrected, the patient's condition is not greatly improved. Attempts to restore the function of the muscular apparatus of the vesical neck have thus far yielded unsatisfactory results; a condition of incontinence persists, necessitating the wearing of an apparatus to lead the urine to a receptacle fastened to some part of the patient's body. Such an instrument is difficult of perfect adjustment, and this, together with its uncleanness, in spite of every care, contributes to render the patient an object of disgust, both to himself and his friends.

These considerations impelled Maydl to suggest the application of ureteral implantation into the rectum in this class of patients.⁴ This operation, designed to divert the urine from its normal course, however, has not met with marked favor among practical surgeons, on account of the threatened dangers of renal infection which the procedure invites. That these fears are not of a purely theoretical nature has been amply proved by the published clinical experiences, as well as the results of experiments upon lower animals, of Gluck and Zeller, Bardenheuer, Tuffier, Smith, and others. More recently, however, attempted improvements in the technique of the operation have awakened renewed interest in the subject, these improvements being particularly designed to furnish protection against infection of the kidneys through the open mouths of the ureters, as these present themselves into the cavity of the rectum.

Four operative procedures have been recently brought forward with this end in view. The first of these, that of Maydl,⁵ is designed to take

¹ Twenty-fifth Congress of German Surgeons.

² *Centralblatt für Chirurgie*, 1897, xxxvi. p. 953.

³ *Beitr. z. klin. Chir.*, Tübingen, 1897, xviii. p. 1-38, 2 pl.

⁴ *Wein. Med. Wochenschr.*, 1896, xvii. pp. 1341, 1333, 1374.

⁵ *Op. cit.*

advantage of the oblique course of the ureters upon the bladder-wall before entering the bladder, together with whatever safeguards are afforded by the arrangement of the mucous membrane of the bladder-wall at the vesical orifices of the ureters. The method of accomplishing this consists in transplanting the *bas fond*, together with the ureters, into the rectum. The second consists in implantation of the ureters into the space occupied by the submucous connective tissue of the rectal wall, turning back a triangular-shaped flap, in a lateral direction for that purpose. A small opening is made in the mucous membrane for the passage of urine, and the flap is replaced and sutured (Krynski).¹ The third, the operation of Vignoni,² is recommended upon the basis of experiments upon animals, and aims to provide a V-shaped valve cut from the anterior wall of the bowel. After placing the ureters upon the flap, the former are covered by suturing over them two lateral folds of the bowel-wall. The fourth consists in transplantation of the bladder-wall at the sites of the ureters to the *posterior* wall of the rectum, through an incision in its anterior wall, a portion of mucous membrane having been removed in order to secure a freshened area for that purpose (Pisani³). The remainder of the bladder is extirpated.

In regard to the first-named, viz., the operation of Maydl, it may be said that the attempt to gain the advantages of pressure afforded by the arrangement of the ureters upon the bladder-wall, as well as whatever aid may be afforded by supposed valve-like folds of the vesical mucous membrane at the mouths of the ureters, are lost when the *bas fond* is transplanted into the rectum. The rectum proper is not a closed cavity in the sense that the bladder is, and accumulating urine cannot exercise pressure to the extent that this occurs in the case of the normal urinary viscus. In addition to this, the procedure requires an extensive dissection of the parts about the base of the bladder.

The second method, that of Krynski, places the ureters in the space occupied by the submucous connective tissue of the rectum. In order to gain access to this, a flap of the serous and muscular coats of the rectum is turned back, being afterward replaced and sutured. No valve is provided for at the mouths of the ureters, reliance being placed entirely upon the pressure of the rectal contents in occluding the ureters beneath the mucous membrane and above their point of entrance into the rectum. Pressure exercised in this manner, as has been shown, is fallacious in accomplishing its object.

In the third, or Vignoni's operation, while an effort is made to secure a valve for the prevention of regurgitation of urine into the ureter, this valve is covered upon its surface presenting to the mouths of the ureters

¹ Centralblatt für Chir., 1896, xxii. 78-75.

² Ibid., iv. p. 85; Gaz. med. di Torino, 1895, xli. 17-25.

³ Ibid., 1897, xxii. p. 631; Policlin., Roma., 1896, iii. p. 332-333.

by serous membrane. The objectionable feature of this method resides in the liability of stenosis of the orifices of the ureters occurring through adhesions between their cut ends and the serous covering of the flap.

The fourth method, that of Pisani, is based upon a supposed sphincter-like action of the vesical mouths of the ureters. In this operation the ureters cross the rectum in an antero-posterior direction, and in this situation may readily form a more or less marked obstruction to the passage of feces. In addition to this, the supposed sphincter-like action of the ureters is alone relied upon to prevent the passage of feces into the ureters.

The method herewith presented is an effort to combine an efficient valve-action with the additional safeguard of compression of the ureters by the circular muscular fibres of the bowel during defecation. The operation is performed as follows: The abdomen is opened in the median line, with the patient in the Trendelenburg position. The anal sphincters are dilated and the rectum should be thoroughly cleansed preliminarily. The ureters are identified in their relations to the vessels, the posterior layer of the peritoneum incised for a sufficient extent to expose them freely, and the ureters traced to their terminations upon the bladder-wall, from which they are detached. The ends of the ureters are cut off obliquely (Fig. 1).

FIG. 1.



The obliquely cut ureter.

A longitudinal incision, 7 cms. long, is now made in the anterior wall of the rectum, only the serous and muscular coats being included in this incision. These structures are dissected laterally until the mucous coat is bared and a diamond-shaped space in the submucous space exposed (Fig. 2). The edges of the incision are retracted by thread retractors, and a tongue-shaped flap of mucous membrane, with its base directed upward, is cut from the mucous membrane in the lower half of the diamond. This tongue-shaped flap is doubled upon itself in an upward direction in such a manner that one-half of its mucous surface presents anteriorly, when it is secured by one or two catgut sutures. A flap-valve is thus secured, both sides of which are covered with mucous membrane.

The ureters are now placed in the incision, so that their obliquely cut ends lie upon the presenting mucous membrane surface of the flap (Fig. 3). A few fine catgut sutures serve to secure the ureters in position in the space represented in the upper half of the diamond, care being taken that these sutures do not invade the lumen of the ureters. The flap-

valve and attached ends of the ureters are now pushed into the cavity of the rectum, and the rectal wound closed in the following manner: The gap in the mucous membrane left by the reflected half of the tongue-shaped valve is first closed by a row of catgut sutures (Fig. 4). The original wound in the rectal wall is closed by fine silk sutures, the upper two or three of these being likewise utilized for still further securing the ureters for the distance which they pass in the submucous space in the upper half of the diamond (Fig. 5). The abdominal wound is now closed.

FIG. 2.



FIG. 3.

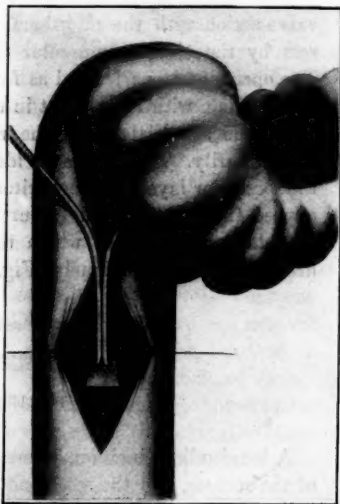


FIG. 2.—Incision on anterior wall of the rectum, including serous and muscular coats. Mucous membrane exposed in a diamond-shaped area, and the edges of the incision retracted by thread retractors. The dotted line shows line of section of mucous membrane to form the tongue-shaped flap.

FIG. 3.—Tongue-shaped flap cut, turned up, and laid upon itself (doubled back). The ureters are placed with their obliquely cut ends lying upon the surface of the flap and secured by catgut sutures in the space in the upper half of the diamond.

A boy, aged six years, referred to me by Dr. McCleary, of this city, was subjected to this operation on September 20, 1896, at the Brooklyn Hospital. Prompt recovery followed the operation. The rectum became remarkably tolerant of the presence of urine from the first day following the restoration of the sphincters, urination taking place per rectum on an average of every three hours. As time passed this toleration became more pronounced, until, at the present time, the intervals do not average more than the normal.

A remarkable fact, brought out by the after-history of this case, is the manner in which the bowel performs its double function as a receptacle for both feces and urine. While urination takes place at about the normal intervals, defecation likewise takes place at normal intervals, although the former occurs about once in six hours, while the latter occurs but once daily. The movement is generally formed, and is not mixed with or accompanied by urine, as far as gross appearances can determine.

FIG. 4.

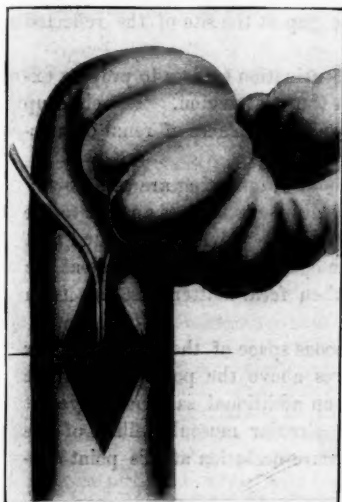


FIG. 4.—Flap-valve and ends of ureters placed in the rectum, and a row of catgut sutures closing the gap in the mucous membrane.

FIG. 5.

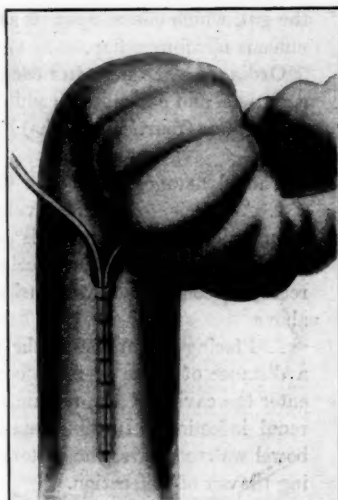


FIG. 5.—Showing the longitudinal incision in the bowel-wall closed by a row of silk sutures. The ureters are shown passing into the upper angle of the closed incision.

In explanation of this the observations of O'Bierne should be borne in mind. This investigator demonstrated by explorations in the human subject that, in the normal state, between the acts of defecation the walls of the rectum are in contact and its cavity practically empty. Under these circumstances, the accumulation of feces takes place above the contracted upper portion of the rectum or at the site of the so-called sphincter of O'Bierne. Every surgeon is familiar with the fact that section or paralysis of the anal sphincters is not necessarily followed by a constant flow of feces; but, on the contrary, this is more or less intermittent, showing that there exists a receptacle for feces above the rectum proper, or at the sigmoid flexure. The act of defecation, therefore, is preceded by the passage of feces from the sigmoid flexure into the

rectum. This sensation of emptying of the sigmoid, followed by the presence of feces in the rectum, gives rise to the desire to evacuate the bowels. Thus there are practically two receptacles at the lower portion of the large intestine: the one the sigmoid, intended for the storage of feces; while the other serves only for its temporary arrest until a convenient opportunity is afforded for its evacuation.

Thus is explained the behavior of the rectum in the case before us. The rectum serves as a receptacle for the urine, while the sigmoid flexure, and the parts above, perform the same office for the feces. This latter is probably favored by the slightly increased narrowing of the gut, which ensues upon closing the gap at the site of the reflected mucous membrane flap.

Ordinary cleansing after each act of urination suffices to prevent excoriations and eczematous conditions in the anal region. The child up to this time (fourteen months) has shown no evidences of renal disturbance.

The advantages claimed for this method of operating are as follows:

1. An efficient permanent valve, with a mucous surface applied to the open mouths of the ureters, is provided. This valve is so situated that it is closely applied to and occludes the open ends of the ureters as the rectum becomes filled with urine, or when fecal matter descends from above.

2. Placing the ureters in the submucous space of the rectal wall for a distance of three or more centimetres above the point where these enter the cavity of the rectum affords an additional safeguard against renal infection. In this situation the circular muscular fibres of the bowel wall compress the ureters and secure occlusion at this point during the act of defecation.

MOUNTAIN FEVER.¹

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DIFFERENT clinical observers who have recorded their observations upon the etiology and symptomatology of this fever for the past twenty years have classified it nosologically as typho-malarial fever, indicating thereby a mixed infection and committing themselves to the doctrine of hybridity of disease; again, as malarial remittent with adynamic tendencies; and, lastly, as typhoid fever indigenous to mountain regions, its clinical history modified by surrounding physical conditions, the

¹ By permission of the Surgeon-General, U. S. Army.

essential lesions being, however, demonstrable, post mortem, in the spleen, mesenteric glands, Peyer's patches, and elsewhere.

As a contribution toward the solution of this vexed and still mooted question of nosological classification, I offer the following clinical histories of cases occurring in this Rocky Mountain region.

The wide clinical variations of typhoid fever are well known to those who have seen many cases of this disease, even in one locality; but its diversified clinical picture is even more striking to one who has seen the disease manifesting itself under different physical conditions as respects altitude, slope of land, variety of soil, etc., as contrasted between the Eastern valleys and the Western highlands.

CASE I.—Mrs. E. W. R., aged nineteen years, married in November, 1894, came into this region in that month from Ohio, near Gallipolis, on the Ohio River, where malaria was more or less prevalent, but from which she had never suffered (except, perhaps, an occasional slight indisposition which might have been attributable to that cause); had never had typhoid fever, and indeed had never employed a physician since infancy until the present instance.

After four months' residence in this climate she began (about April 1, 1895) to feel listless and indisposed to exertion; this was also her monthly period, the flow being somewhat scanty and continuing but three days.

She had an ulcer on the right side of her tongue, well back, which distressed her considerably and precluded solid food being taken. It healed in about a week under a borax wash, by which time complete anorexia had set in. Her complexion became sallow, especially about the lips and mouth; conjunctivæ also sallow; bowels inclined to constipation. On solicitation of friends she took "liver medicine" and Cuticura Resolvent for the blood, and vegetable laxative pills, in doses of four or five, for three or four times at intervals of three or four days.

These pills had only a mild laxative effect, causing one daily evacuation. On April 20th, in the afternoon, Mrs. R. began to feel chilly every time she stepped to the door, which she did frequently, watching expectantly for letters by the mail-coach. By the time for the evening meal she felt weak and nervous, and while preparing to retire, at 9 o'clock, she had a rather distinct chill, with chattering of the teeth, lasting for five minutes. She took twelve grains of quinine; was restless all night; felt feverish the next morning, but got up and lay about the house on the sofa and couch. She took fifteen grains of quinine, which made her head ring all day; loss of appetite complete; restless the following night, and so thirsty that "water did not seem to quench thirst." The next day (Monday, April 22d) she felt very "sore" in the lower limbs and back, and kept about the bed-room in her wrapper, but could not rest.

She felt better sitting up than lying down, on account of body aches. The bowels were constipated. A dose of liver medicine was taken the night previous as a laxative, but without effect. It was followed Monday morning by five vegetable cathartic pills, which operated the following morning. She had had no headache at any time except that attributed above to the quinine.

On Tuesday morning (April 23d) I saw the case for the first time. Found the temperature 102° F., pulse 110 per minute, regular and of good force and not dicrotic. The patient was sent to bed and kept there for eighteen days (April 22d to May 9th). There had been no epistaxis; no pain nor gurgling (though examined for) in the right iliac fossa. The left knee-joint was so sore as to interdict movement—"felt like rheumatism." In a few hours the other knee and both elbows became painful, and felt as if "it would be a relief if some one would break them or make them crack." These joint-pains kept up for about one week. On the afternoon of the day previous to my seeing her red spots first made their appearance; first noticed on the back of the hands. By morning roseola spots appeared over the body generally. On Monday the spots "covered" the face, each spot being, however, discrete, papular, rose-colored, disappearing on pressure and returning immediately the pressure was removed. Those on the face were the last to appear and the first to disappear.

While the spots increased numerically during the first few days, there was not manifest the cycle of three days for the appearance and disappearance of successive crops; but while many of a given crop would fade away, others of the same crop would persist for ten days or a fortnight; and even one month from convalescence maculae were visible over the hands and feet beneath the sites where roseola papules were previously located.

The tongue throughout the disease had a thick, white coat with red tip and edges. The temperature for the eighteen days ranged between 100° and $103\frac{1}{2}^{\circ}$ F. The temperature-curve was not recorded. Quinine had no perceptible effect on the fever, although a tentative dose of ten grains was administered in the early morning on April 23d.

The patient was not known to have muttering delirium at any time, but felt worse after sleeping; hence she tried to avoid going to sleep through the daytime, and would often wake up frightened and nervous.

The dejections from the bowels for the first few days were dark colored, and then later were of a yellow color and semi-liquid consistence.

There was usually but one movement a day, the tendency to constipation being marked, for these passages were secured only after the administration of compound cathartic pills, as follows: Three on the 25th of April, two on the 26th of April, and one every other day until May 9th, when complete defervescence of the fever took place through a marked diaphoresis occurring the evening before, the afternoon temperature of May 9th being normal. Since convalescence the patient has been in the habit of taking vegetable laxative pills to keep the bowels regulated.

No herpes labialis appeared.

From subsequent experience in finding gurgling in the right iliac fossa in all the eruptive cases, I have no doubt that a little more caution on my part would have elicited it also in this case.

REMARKS. On seeing this case I called the attention of the husband to the similarity of the eruption to the roseolar spots of typical typhoid fever, and he, having recently passed through an attack of that fever in the East, was outspoken in his assertion that this was certainly not a case of that disease. The absence of tenderness over the right iliac fossa and the non-elicitation of gurgling, the presence of jaundice, the

well-nigh obstipation of the bowels, the failure on my part to elicit a careful history of the invasion and progress of the case, led me to regard it as probably a case of malarial remittent fever with hepatic engorgement. This, too, in the face of the fact that I was on the lookout for typhoid fever and was familiar with the article of Surgeon John Van Hoff, U. S. Army, and Surgeon J. J. Woodward's remarks, as published in *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES* for January, 1880, and treating of cases occurring among troops scouting through this very locality in 1878.

Even the failure of quinine to affect the fever did not dispossess my mind of the supposed malarial origin of the case, I attributing the want of specificity of the remedy to the disproportion between its dosage and the intensity or saturation of the infective element. It was not until late in the treatment of the case that the conviction forced itself upon my mind that I had been dealing with disease processes evoked through the agency of the bacillus typhus abdominalis. My slowness in arriving at this diagnosis, if it be the correct one, will appear less surprising when I state that of the seventy or more cases referred to in this paper and gathered from the practice of the Lander Agency and Post physicians not one-sixth of them was diagnosed typhoid fever by the physicians who attended them, and many of the cases are still regarded as other than typhoid fever by one or two of the physicians referred to.

CASE II.—F. F., aged twenty-three years, private, Company F, Eighth Infantry, Pole, was admitted into the Post Hospital on account of fever on April 25th, and *again in May*.

Before reciting the clinical history of his three weeks' fever in May I wish to give the history and temperature-record of his previous attacks, together with three other cases of continued fever admitted about the same date, namely, those of Private Hogan (April 21st), Finn (April 20th), and Manning (April 22d).

These four cases occurred in April. Hogan, aged twenty-two years, American, admitted April 21st; had been sick two days before admission; had felt "all broke up;" had had a chill (after fishing and getting wet) that lasted for fifteen or twenty minutes; teeth chattering; "shivering and sweating at the same time;" had had two or three chills on the night of April 19th, with headache, and eyes painful when turned to the right or the left. While in the hospital his tongue was coated with a white fur and bowels constipated; given a Seidlitz powder; had two or three movements a day, which were fluid and of a yellow color. No spots were observed, and indeed were not looked for. Left the hospital May 3d, feeling "strong and well and ready for duty."

Finn, aged twenty-five years; Irish. During his four years' residence in this climate has had headache in early springtime. When admitted (April 20th) yellowish-white coat on tongue; constipated; given Seidlitz powder; had three loose yellow-colored passages the first day; two the next. Had felt sick for nearly a week before coming into the hospital, the sight appearing dim, with dilated pupils. His attention had been called by his comrades in the barracks to the large size of the

blacks of his eyes. No spots were observed, and none indeed were looked for. Remained in the hospital five days, and felt well after going out.

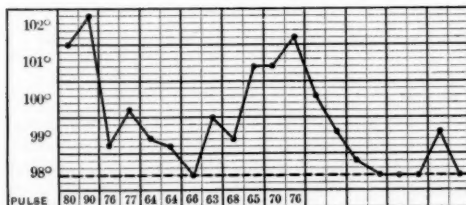
Manning, aged twenty-four years; American. Admitted April 22d; constipated; movements dark and hard; glycerin enema and salts by mouth; passages never fluid nor yellowish as far as observed. No spots looked for.

Fabianski (April 25th). The day previous to admission had felt "awful weak; could hardly stand on his feet;" had had headache and felt restless all night; constipated. On admission had white-coated tongue; laxatives given—compound cathartic pills and Seidlitz powder; dark-green looking passages; on the third day says he felt better; was confined to bed for six days; up and about the ward for four days and then returned to duty. Expressed himself as feeling well and fit for duty. Never had been sick before, as long as he could remember.

These four cases, occurring in April, were carried on the register as cases of malarial remittent fever, the type of fever heretofore met with during my three years' service at this post being intermittents, with one or two exceptions, which were recognized as more or less typical cases of typhoid fever.

I submit a temperature-chart typical of these four cases.

CHART 1.



The return to sick report of Fabianski, on May 18th, with a history of the case, as follows, and the temperature-record subjoined, may throw some further light upon the four cases above cited.

On Monday, May 13th (five days previous to coming on sick report), after wheeling 375 pounds of oats in a barrow, his limbs easily tired, until Thursday morning, on coming off guard after a tiresome walk on post from 3 to 5 o'clock, he felt himself quite worn out. He then lost all appetite; drank only milk and coffee. Came into the hospital Saturday noon, May 18th. On Monday, the 20th, red spots appeared on the arms and feet. On the previous day he had ached all down the spine from the cervical region. On Tuesday his elbows and knees ached; "felt like they were broken off." Eruption became general. Passed flatus per anum, and asked for a Seidlitz powder to make bowels move. None given. Two movements from bowels later in the day. Spleen enlarged. Exclusive milk-diet ordered. On the previous night patient

had been delirious; talked in his sleep, saying that he wished to go to the rear and hoped the nurse would not take his bed.

May 22d. One movement from bowels this morning; slept well; tongue cleaning off at tip and sides and up centre; gurgling in right iliac fossa; no headache; drank two quarts of milk during the morning; four movements of bowels during the afternoon—liquid, ochre-colored, and bad-smelling. 7 P.M. Marked meteorismus; began Woodbridge's treatment, one No. 1 pill every fifteen minutes, each dose followed by two ounces of water, distilled or sterilized by boiling, or milk.

23d. Two liquid, ochre-colored stools during the day; meteorismus not so marked; tongue still coated, with red tip and edges; eruption still persists; thirty-four ounces of urine the past twenty-four hours.

24th. Large, soft, greenish movement with foam; No. 1 pills continued; six quarts of milk and three quarts of sterilized water taken during the last twenty-four hours; eruption fading; meteorismus less marked; slept well last night; watches the clock for time for pills; says if he had a good square meal thinks he would be all right.

25th. No movement of bowels for twenty-four hours (8 A.M. to 8 A.M.). No. 1 pills continued and No. 2 pills begun; two quarts of milk taken; eruption still persists; tongue still coated with a white fur, but clearing off slowly at tip, up the sides, and up the centre; meteorismus less marked; bowels moved at noon, giving a large, soft, yellowish movement.

26th. Last twenty-four hours drank four quarts of milk; at noon pills were suspended on account of complaint of sore-throat, the zygous uvula appearing much swollen, but no congestion or exudation observable in the throat. At this time had a large pea-soup-looking discharge from bowels. Ordered 130 grammes of quinine t. i. d. Tongue has still a white coating, except at tip, along the edges, and up the centre; pupils dilated; meteorismus gone. The eruption comes out most distinctly when the arms are kept under the blankets. One chopped-spinach stool in the evening.

27th. Back and abdomen and the body generally covered with roseolar spots of the size of a split pea. One thousand spots counted on the back alone. Two soft, yellowish-green movements from the bowels.

28th. Ochre-colored fluid stool at 5 P.M.; pupils dilated.

29th. No movement of bowels.

30th. Appetite improving; milk-diet; pupils less dilated; soft, yellow motion from bowels.

31st. Spots well marked, but fading slowly; tongue cleaning slowly; pupils less dilated; at 7 P.M. glycerin enema; small, yellow action.

June 1st. Patient looks pale and thin in the face; temperature 98° F.; pulse 64; pupils dilated; tongue still coated; no movement of bowels.

2d. Looks emaciated and pale; gurgling still found in right iliac fossa; spots that were marked with ink several days ago still persist; a glycerin enema brought away an enormous soft, ochre-colored stool. He had no nose-bleed at any time.

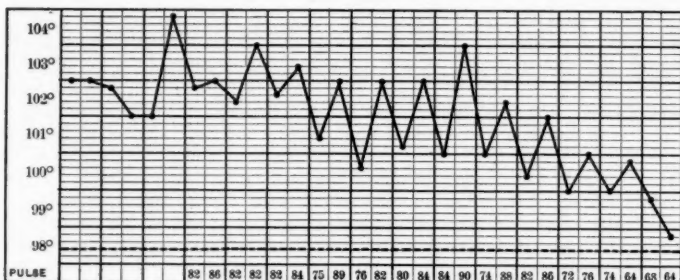
3d. Temperature normal; thin white coat on tongue; two soft, ochre-colored stools; pupils dilated.

4th. Glycerin enema, followed by a large, soft, ochre-colored stool; a stool of the same character on June 5th, 6th, and 7th.

8th. One large, well-formed, dark-colored stool.

9th. Tincture of digitalis ordered to be taken, 0.650 c.c., t. i. d.
15th. Returned to duty.

CHART 2.



REMARKS. I have noticed throughout my cases that the severity of the disease bore a close relation to the abundance of the eruption. In the case of Mrs. T. (a case that recovered, but not elsewhere referred to in this paper) the eruption was abundant all over the body, and the disease was severe, being complicated also with pneumonia of the right lung—the only one of my cases in which there has arisen any complication.

CASE III.—J. A. B., aged twenty-four years; American, private, Company F, Eighth Infantry, entered the hospital on May 26th.

Previous history. Had a sick spell about one week ago, with fever; took four purgative pills, which moved bowels three times; had headache; pains and aches in calves of legs and small of back.

Condition on entrance. Temperature $101\frac{1}{2}^{\circ}$ F., pulse 100; mental hebetude; very drowsy and somnolent; thick, white coat on tongue; took two laxative pills yesterday, which moved bowels once to-day; anorexia complete; "cannot eat anything at all;" slight pains in bowels in hypogastric region. No nose-bleed.

May 26th. Two movements from bowels through the night; ordered 0.0065 gramme podophyllum and 0.0065 gramme calomel every hour through the day. Three movements since noon of chopped-spinach character; powders stopped; patient somnolent all through the day; milk-diet. 7 P.M., a few small roseolar spots on front of chest and over scapulæ. The tongue looks as if it had had a coat of white paint except at tip and edges and up centre; gurgling in right iliac fossa, with slight tenderness.

27th. Numerous small, typical roseolar spots over scapulæ and some few over front of chest. Tongue looks as if it were daubed with white paint mixed with a little blue, with red tip and edges and a small, red arm of flame up the centre. 6 P.M., retention of urine for twenty-four hours; water drawn off with catheter; pupils dilated; no alvine evacuation; passed urine voluntarily later in the evening.

28th. Pupils contracted to normal; no medicine prescribed; milk ordered; evening temperature 99° F., pulse 74; tongue coated; pupils again dilated; urine had to be drawn.

29th. Temperature normal; tongue clean; spots persist that were inked three days ago; patient falls off to sleep at once after having his attention aroused. No movement of bowels after injection last night of 64 grammes of sweet oil and this morning of 4 grammes of glycerin; Seidlitz powder ordered; a dirty-yellow alvine dejection resulted; urine had to be drawn.

30th. Spots still persist; no movements of bowels; water drawn.

31st. Eight grammes of glycerin by rectum, causing the evacuation of a very large ochre-colored stool of medium consistency.

June 1st. Temperature normal; pulse 64; patient looks bright and says he feels strong. 7 P.M., passes urine voluntarily; temperature 98° F., pulse 60; one large ochre-colored stool at midnight.

2d. Eruption persists; tongue has a thin, white coating; one dark-colored stool.

3d. Temperature normal; eruption fading; thin, white coat on tongue.

4th. Glycerin enema, followed by a large, soft, ochre-colored stool.

5th. Tongue slightly coated; Seidlitz powder.

6th. Tongue slightly coated; enema of glycerin; no action of bowels; eruption faded; pupils contracted to normal.

8th. Well-formed, light pasty stool; eruption gone; tongue clean; tincture digitalis, 0.650 c.c., t. i. d., with wine tonic.

10th. Patient allowed to be up and around the ward. During the day patient began throwing off from stomach, and was sent back to bed.

11th. Tongue again coated; temperature raised; somnolent; stomach unsettled.

12th. Thin, brownish stool; tongue coated; gurgling elicited.

15th. Large, soft, ochre-colored stool. Tongue cleaning slowly.

17th. Convalescing.

CASE IV.—W. S., aged thirty-seven years; American, private, Company F, Eighth Infantry, admitted to the hospital at 4 P.M. on May 30th.

Previous history. Had felt badly for three days; legs ached till he could scarcely lie on his bunk; head ached; the "cords of his eyes" were sore; his limbs from his hips down felt very "sore" and ached wretchedly. Anorexia complete; had eaten nothing but a little bread with coffee and a little milk for three days. Had had small movement of bowels each day. On the morning of the day of admission the movement was loose.

On admission tongue was slightly coated; rest in bed and milk-diet ordered; at midnight had a loose, dark-colored motion.

May 31st. Gurgling in right iliac fossa; no tenderness; no spots on the skin. 7 P.M., tongue dry and glazed; glycerin enema; large, lead-colored action; later had a small, dark-colored, lumpy dejection.

June 1st. No movement of bowels; ejected solid curd from stomach; milk to be boiled hereafter and a little salt added; pupils slightly dilated; temperature 101½° F., pulse 52. Thin, yellowish-white coat on tongue, inclining to dryness; no spots observable.

2d. Tongue dry and glazed with a thin, whitish coat. No spots have appeared; distinct gurgling in right iliac fossa; glycerin enema ordered; small, well-formed, yellowish-green movement; later, at 11 P.M., a large, dark-colored motion.

3d. Temperature normal; tongue slightly coated; no eruption seen throughout the case. 7 P.M., tongue clean.

4th. Pain in the hamstring muscles kept patient awake throughout most of the night; thin, white coat on tongue; glycerin enema; small, yellow stool.

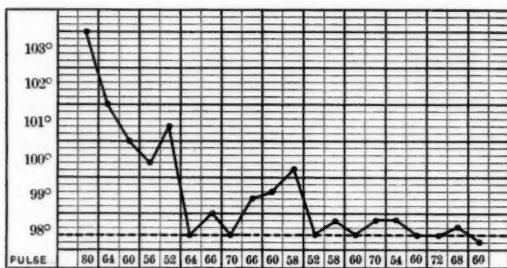
5th and 6th. Small, liquid, yellow evacuations, one each day. Castor oil, 32 c.c.; no response in eight hours; glycerin enema; large liquid and lumpy yellow motion.

7th. Castor oil, Seidlitz powder, and glycerin enema administered again to-day, causing several fluid, ochre-colored motions.

8th. Wine tonic.

15th. Returned to duty.

CHART 3.

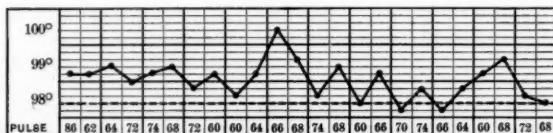


CASE V.—J. P., aged twenty-five years; American, private, Company F, Eighth Infantry, admitted to the hospital on May 31st.

Previous history. On the morning of May 29th had had headache when he went on guard. On the evening of May 30th he was not feeling well; had dizziness of the head; had had headache while walking post; bowels had moved once a day.

May 31st. On entrance temperature $99\frac{1}{4}$ ° F.; gurgling in right iliac fossa; no tenderness; no eruption; tongue had a thin, white, glazed coat on it; headache. 7 P.M., glycerine enema; no action.

CHART 4.



June 1st. No eruption; bowels bound up.

2d. Gurgling elicited; no movement of bowels; breath heavy and offensive; ordered 0.003 gramme calomel every ten minutes for one hour, followed by a Seidlitz powder; after a second Seidlitz powder the bowels moved at 4 and 9 o'clock P.M., the stools being liquid and ochre-colored.

3d. Had a large, well-formed, yellowish movement, the stool appearing like candles or sticks of rolled sulphur; gurgling in right iliac fossa; no eruption observable throughout the case. 7 P.M., tongue has thin, white coat upon it.

14th. Patient has had several large, soft, well-formed motions (in shape and of color of rolls of sulphur) since the 4th instant. To-day patient was up and about the ward.

17th. Convalescing.

CASE VI.—J. F. S., aged twenty-four years; American, private, Company F, Eighth Infantry, admitted to the hospital on May 31st.

Previous history. Got up out of bed on the morning of May 30th feeling sleepy, with slight pain in left side; no headache; bowels moved twice the day before; rather constipated movements.

On entrance the tongue had a thin, whitish, glazed coat upon it; both sides of the body, from chest to knees, felt as if he "had walked about thirty miles;" gurgling in right iliac fossa; no eruption. 7 P.M., temperature 104° F., pulse 120; tongue dry and brown; sleeps continually; subsultus tendinum; 4 grammes of glycerin by enema; small, well-formed, black motion; later, a yellowish, watery defecation.

June 1st. Sleeps continually; fingers and hand twitch; two quarts of milk to be given within twenty-four hours; Woodbridge's pills No. 1 ordered given every fifteen minutes, each dose followed by 64 c.c. of boiled water or milk; four hours later patient vomited a quantity of greenish-yellow fluid. 8 P.M., water had to be drawn with catheter; gurgling in right iliac fossa; pupils dilated; no eruption.

2d. Tongue has a thick, white coat, but keeps moist; urine passed voluntarily; a few roseolar spots over right scapula; glycerin enema, followed by a liquid, dirty-brown movement.

3d. Large, brown, liquid stool at midnight; gurgling; tongue has a white coat.

4th. Thick, white coat on tongue, except tip and edges; glycerin enema; large, soft, clay-colored motion.

5th, 6th, and 8th. A soft, dark-brown motion.

10th. Tongue nearly or quite clean; patient allowed to be up and about the ward.

12th. Vomiting; inability to retain nourishment on the stomach; sent to bed.

13th. Tongue has a thick, white coat upon it.

14th. Coating of the tongue begins to peel off in flakes, leaving the surface red.

15th. Thin, yellow stool. Condition improving.

17th. Convalescing.

CASE VII.—D. S., aged twenty-six years; Irish, private, Company F, Eighth Infantry, admitted to the hospital on June 1st.

Previous history. Felt drowsy the day before admission; had one movement of bowels.

June 1st. No alvine evacuation; no gurgling detected; pupils moderately dilated; drank two quarts of beer to-day before admission.

2d. Thick, white coat on tongue; breath heavy and offensive; no gurgling detected; no eruption, except some spots of acne between the scapulae; no movements of bowels; ordered 0.003 gramme calomel every ten minutes for one hour, followed by Seidlitz powder. After a second Seidlitz powder the bowels moved at 4 P.M., the stools being

liquid, of a dirty-brown color, and containing a large quantity of fecal matter. Thin, white coat on tongue; gurgling in right iliac fossa elicited.

3d. Temperature normal; no roseolar eruption observable except perhaps one spot on front of chest, of rose color, papular, and disappearing on pressure. There are many spots of acne on the back. Tongue is still heavily coated and breath foul; pupils dilated; gurgling in right iliac fossa.

4th. Thin, white coat on tongue; breath heavy and foul; glycerin enema; no action.

5th. Glycerin enema; no action.

6th. Castor oil, 32 c.c.; large, well-formed, light-yellow movement.

15th. Returned to duty.

CASE VIII.—A. I., aged twelve years, first seen professionally on the evening of May 25th.

Previous history. On May 21st she became languid; her head felt "heavy, like she could not walk around with it," and she wanted all the time to lie down. No appetite since; no nose-bleed; the next day the left ear began to ache, and, finally, a day or two later, "broke and ran." On May 23d had oatmeal and soft-boiled egg; not retained on stomach.

May 24th. Bowels moved; no movement on the 25th or 26th of May, although laxative pills had been taken. Slept poorly on the night of May 24th, and had talkative delirium.

26th. Thin, white coat on tongue; one roseolar spot on right cheek; gurgling in right iliac fossa; no tenderness; pupils dilated; Woodbridge's pills No. 1 begun; milk-diet.

27th. Had headache last night; did not rest well; talked in her sleep; injection of soap and water into the bowels, which resulted later in a dark-colored, lumpy motion; one additional roseolar spot on right cheek; none on body. 7 P.M., pupils dilated; patient was hungry this afternoon and wanted potatoes. Woodbridge's pills No. 1 given throughout the day every fifteen minutes. "It looks like a chicken eating corn," remarked the good housewife and mother.

28th. The bowels moved early this morning, giving a soft, lead-colored motion; tongue cleaning, coat becoming thinner; two spots on right cheek still persist; two roseolar spots appear on right forearm and one on left. 5 P.M., small, greenish-yellow evacuation. Tongue cleaning off up the middle.

29th. Temperature 99° F., pulse 78; tongue still coated; pupils dilated. 6 P.M., temperature 98½°. Patient was found dressed and sitting up, contrary to my instructions.

30th. My admonition to the contrary, patient went to out-of-door Decoration Day services. Evening temperature normal.

CASE IX.—J. C., aged forty-nine years, Irish, hospital steward U. S. Army, returned from a six months' furlough, arriving in Lander (sixteen miles from post) on the morning of May 25th. Remained in Lander two days, during which time his bowels moved freely, about six times in each twenty-four hours. Rode sixteen miles by stage to his post on May 27th, and kept about his usual vocations until June 3d. On that morning, on rising, he felt a great deal of malaise and dull, shooting pains across his back and hips; could not bend forward on account of a severe lumbago; felt disinclined to do anything; had

four loose movements of the bowels during the day; no nose-bleed; never had typhoid fever. Gurgling in right iliac fossa; no eruption. Bread-and-milk diet.

June 4th. Woodbridge's pills No. 1 begun. In the afternoon the steward's tongue became covered with a whitish-blue coat; he feels very drowsy, and when he falls to sleep perspires profusely. Bowels moved twice during the night, the stools being thin and ochre-colored.

5th. Temperature slightly subnormal; skin cool and clammy; patient feels drowsy all the time; tongue heavily coated; pupils slightly contracted; soreness and pains from the level of the fourth rib to the feet, especially if limbs be moved, either extended or drawn up; pain and soreness chiefly in the quadriceps extensors, as after walking a great distance; two stools, fluid, yellow, and of chopped appearance; temperature normal, pulse 66; pupils contracted; no eruption has appeared. During the past twenty-four hours patient has taken sixty No. 1 pills; pills discontinued.

6th. Soreness through the hips and in the groins; tongue still coated; one large, well-formed, clay-colored fecal evacuation.

7th. Large, soft, ochre-colored motion; diet, milk and beef-broth; tincture iodine and carbolic acid, pure, each 0.200 c.c., in milk t. i. d.

8th. Large, soft, well-formed, dark-colored movement.

9th. Large, soft, well-formed, dark-colored stool; patient sat up to-day.

10th. Patient up and around to-day.

12th. Steward was returned to duty; solid food allowed tentatively. Convalescence was rapid and uninterrupted.

CASE X.—W. M., aged fourteen years, living on Big Wing River, was ploughing on May 26th, when his horses ran off, and while in pursuit he got heated up and got wet in the river. The next day he had headache; felt chilly sensations and flashes of heat over his body; head felt stopped up; tongue had a white coat; bowels constipated at first; salts were taken, then diarrhœa set in; eruption all over body, except face; first appearance on May 28th on the wrists; had high fever; was delirious, groaning in his sleep. Never had typhoid fever.

REMARKS. This case is typical of several that I have prescribed for at a distance, but which I have not seen.

My notes of the case are very meagre, being such as could be gathered from the messenger.

CASE XI. *Malarial intermittent fever.*—F. G. W., aged forty-one years, industrial teacher; came from Kentucky to this region seven months ago. The messenger gave the following history of the case:

Had been ailing for about a week, still keeping around at his duties, bones aching and chilly sensations. Got up two or three mornings ago and thought he would freeze to death, so got back into bed to get warm. The morning was that of an ordinary spring day. After laxative medicines his bowels began running off. To use the patient's own words, "there was a bushel of cold running from me." His face looks tanned, yellowish. Headache severe. Had a severe attack of typhoid fever three years ago, and came near dying. Lay in bed for a month, and was out of his head two weeks of that time. Says he now feels just like he did when he took down with typhoid.

REMARKS. This case was reported to me on May 30th, and, being on the lookout to find, if possible, a case of this eruptive (mountain) fever in a patient with an unmistakable previous history of an attack of typhoid, I took occasion to visit this case on the following day (May 31st) and found: tongue slightly coated; no gurgling in right iliac fossa; no tenderness; no eruption; bowels inclined to constipation; pupils normal; temperature and pulse normal. Within twenty-four hours the patient went about his work.

CASE XII.—D. A., aged twenty-three years; American.

June 4th had slight headache.

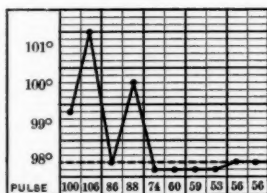
5th. Felt drowsy on getting up; stretchy; ate very little breakfast; has no appetite; very thin, white coat on tongue; threw up from his stomach at noon; eyes injected; pupils normal; gurgling in right iliac fossa; no eruption.

6th. Four evacuations of the bowels during the night, the motions being liquid, ochre-colored, and tinged with blood; four liquid, chopped-spinach stools during the day. A few roseolar spots between scapulae; pupils dilated; gurgling and tenderness.

7th. Three liquid, ochre-colored stools.

8th. Temperature subnormal; pulse in the fifties; no movement of bowels; tongue still coated with a white fur; occasional perspirations with chilly sensations. Digitalis administered; patient up on the 10th; solid food used tentatively on the 13th; convalescence rapid; no relapse.

CHART 5.



REMARKS. The above histories of cases, with their temperature-charts and pulse-records appended, will afford a sufficiently clear clinical picture of the eruptive fever now endemic in this locality, but as to the essential nature of which the practising physicians in the vicinity differ in their opinions. For this reason and to the end that we might arrive at the true solution of the difficulty, I have requested my friends, Dr. F. Welty, agency physician, Shoshone Agency, Wyoming, and Dr. H. L. Callaway, county physician and city health officer, Lander, Fremont County, Wyoming, and other physicians of that city, to contribute a quota of cases of eruptive fever from their practice and express their opinion of the one or more varieties of these eruptive, febrile cases.

Dr. Callaway, under date of May 28th, writes me:

"I send you notes of sixteen cases. You will find that I have named all of them. Have not given you all of my cases (in May and June, 1894), as these were more simple."

He classifies them as follows: Four typhoid fever cases, four cases of purpura simplex, eight cases of purpura rheumatica (simplex).

Typhoid Cases.

CASE I.—B., female, aged nine years; taken sick June 18, 1892. Duration of fever twenty-eight days. Complete recovery by lysis.

CASE II.—S., male, aged twenty-three years; taken sick July 13, 1893. Duration of fever three weeks. Complete recovery by lysis.

CASE III.—H., male, aged twenty-six years; taken sick June 10, 1894. Duration of fever twenty-seven days. Complete recovery.

CASE IV.—L., male, aged twenty-eight years; taken sick December 28, 1894. Duration of fever twenty-eight days, with a relapse of twenty-six days. Complete recovery by lysis.

REMARKS. The above were typical cases of typhoid fever. Constipation in two cases; diarrhoea in two cases.

Purpura Simplex Cases.

CASE I.—E., male, aged thirty-eight years; taken sick June 12, 1894. Duration eighteen days. Complete recovery.

CASE II.—N., male, aged twenty-five years; taken sick June 18, 1894. Duration fourteen days. Complete recovery by lysis.

CASE III.—N., male, aged twenty-two years; taken sick June 28, 1894. Duration twelve days. Complete recovery by lysis.

CASE IV.—K., female, aged twenty-three years; taken sick July 2, 1894. Duration eighteen days. Complete recovery.

REMARKS. Constipation in all cases. Headache, malaise, anorexia, pains in back and in loins.

Purpura Rheumatica (Simplex) Cases.

CASE I.—C., female, aged nineteen years; duration eighteen days. Complete recovery by lysis.

CASE II.—P., female, aged six years; duration fourteen days. Complete recovery by lysis.

CASE III.—N., aged six and one-half years; duration twelve days. Complete recovery by lysis.

CASE IV.—N., male, aged thirty-five years; duration fourteen days. Patient was not in bed. Complete recovery.

CASE V.—G., female, aged thirteen years; duration twenty-four days. Complete recovery.

CASE VI.—N., female, aged twelve years; duration twelve days. Complete recovery.

CASE VII.—S., female, aged thirteen years; duration thirteen days. Complete recovery.

CASE VIII.—E., male, aged forty-two years; duration sixteen days.

Symptoms. Malaise, anorexia, debility, headache, pain in back and

limbs, constipation, pulse 100 to 118, temperature 100° to 103° F. for two to five days, then pains in joints, ankles, knees, elbows, wrists, and finger-joints; also some swelling in joints when fever is at its height.

Eruption appears *first* over joints that are swollen and painful, then over entire body save face. Eruption lasts from three to five days. Temperature drops to almost normal during the eruption. When the eruption disappears the temperature goes up to 102° or 103° F. for one or two days, then gradually falls to normal, and complete recovery follows.

Treatment. Aromatic sulphuric acid, quinine, sodium salicylate, and phenacetine.

Dr. Callaway also remarks that the cases he had last fall are not the same he had this spring. Last fall there was no pain nor swelling in the joints. This spring there was fever for three or four days (101° to 104½° F.). On the fifth day after I saw the cases an eruption appeared, papular, rose-colored, discrete; disappeared on pressure; lasted three, four, five, or seven days. During the eruption the temperature dropped to 101½° F. in the afternoon; then on disappearance of the eruption in two cases the temperature rose to 102½° F. for two days; then rapid defervescence of the fever and convalescence.

Pains and swelling in joints, especially in knee and elbow, and less frequently in ankle, wrist, and joints of the fingers.

Patient starts in feeling bad, slight nausea and dull headache, pain in back and constipation. These were symptoms occurring previous to my first visit. There was constipation in all cases except one, in which there was diarrhoea.

Treatment. Laxative, calomel, one-eighth grain, and sodium bicarbonate, 2 grains every two hours until bowels moved freely, then Rochelle salts as required. Color of stools not noted. Tongue had whitish coat, thick and flabby, with red tip; anorexia, loss of flesh, weakness.

Dr. P. Welty, physician to the Shoshone and Arapahoe tribes of Indians, whose reservation surrounds the military reserve of Fort Washakie, has given me a numerical summary of cases of eruptive fevers among these Indians and the percentage of mortality. His cases among the Shoshones aggregate eighteen, with a mortality per cent. of 16⅔, and among the Arapahoes twenty-five, with a mortality per cent. of 20.

The following case which I saw with Dr. Welty on one occasion will serve as an example of the general run of these eruptive fevers among the Indians:

Wallowing Bull, a large, muscular Arapahoe, aged about forty-eight years, was seen on May 23, 1895. Four days previously had felt "hot and cold;" has had headache and vomiting. One loose passage from the bowels each day; a dark-colored liquid stool was noticed on the hillside. These movements had followed the administration of laxatives. On May 23d (the day of observation) the temperature was 102½° F., pulse 85; gurgling elicited in right iliac fossa; rose-colored papular eruption over body and extremities; tongue coated with a moist, whitish fur, with red tip; tremulous when protruded; small macule on roof of hard palate.

When this case was seen two weeks later by Dr. Welty, the following symptoms were noted: Tongue clean, appetite good; bronchitis, with profuse expectoration of white, frothy mucus, not blood-stained; skin mottled as if bruised, some of the petechiæ being as large as a silver quarter; pulse 65; sore and stiff in feet; no swelling of ankle or other joints; constipation, Epsom salts being asked for.

In the mean time another case had developed in an adjoining tepee:

Yellow Calf's squaw, aged twenty-five years, who presented gurgling in the right iliac fossa; no tenderness; constipation; white, moist fur on tongue, that organ being tremulous when protruded; voice shaky; eruption well marked, papular, and rose-colored; pain in the back of neck, loins, thighs, and legs.

This disease attacked Indians of all ages from the papoose at the breast to the sexagenarian. The following numerical classification of the cases, according to ages, is significant: One case occurring in infancy, seven between two and ten years, twenty-four between ten and thirty years, eleven above thirty years.

Two of the fatal cases ere as follows:

CASE I.—Tashiquata, squaw, aged about twenty years, died June 12, 1893. This squaw had been sick about three weeks when I saw the case with Dr. Welty, the day previous to her death. She presented a deplorable picture; her body covered with blotches caused by extravasations of blood into the areolar tissue; her hard palate and mucous membrane of the mouth presented abundant petechiæ; blood escaped from the nose and mouth, and bloody, liquid, involuntary discharges from the bowels; rapid breathing of a panting character; mucous râles over the chest; tumefaction of the abdomen; pulse rapid and weak; pupils dilated; putrefactive changes setting in almost ante mortem; autopsy impracticable.

CASE II.—Zego's child, aged eighteen months, nursing; sick between three and four weeks; temperature (May 14, 1895, when I saw the case in Dr. Welty's absence) 102° F., pulse too rapid to count—a running pulse. The right cheeks, thighs, and buttocks were the seats of hemorrhagic purpura, the skin being stiff and hard, of leathery consistence, or resembling heavy parchment paper, crumpled in places and raised above the underlying tissues, being, in fact, one dark purple mass of hemorrhagic extravasation. Petechiæ abundant over the hard palate and over the entire cutaneous surface of the body. Respiration fifty to the minute. Child died May 18, 1895. Autopsy impracticable.

The usual history of these eruptive cases among the Indians, as given me by Dr. Welty, is a fever of two, three, or four weeks' duration, attended by a rose-colored eruption, frequently associated with maculæ or petechial spots or patches; tendency to constipation; later the bowels move without laxatives; white coat on tongue, with red tip and edges; tongue tremulous when protruded; pulse not always in rhythm with the temperature; loss of flesh; debility; convalescence slow.

Dr. Welty remarks:

“I consider these cases a purpura simplex, rheumatica, and hæmorrhagica. The simplex cases are those in which the rose-colored papules are the chief feature in the clinical history. The rheumatica cases are

those in which pains in the joints are associated with the eruption. The hemorrhagic cases are those in which petechiæ or purpuric spots are present."

REMARKS AND CONCLUSIONS. It is a matter of great practical importance to the health and welfare of this community that its sanitary officers—the health officer of the city of Lander, the agency physician to the Shoshone and Arapahoe tribes, and the post surgeon of Fort Washakie—should seek to determine whether these endemic eruptive fevers (apparently so dissimilar among themselves and so at variance in their clinical features with the descriptions of typical cases of fever in our text-books) are essentially one and the same disease or entity, and if so whether that disease be typhoid fever—a preventable and well-recognized disease in its semeiology, pathology, symptomatology, and treatment—or whether these eruptive cases belong nosologically or etiologically to two or more distinct classes of diseases, as typhoid and purpura, the latter of which we know little regarding its causation, prevention, or cure. When we regard the usual fatality of typhoid fever from 5 to 15 per cent. and more, it is not a little surprising and perplexing that among forty or more cases of these eruptive fevers occurring among the whites in this vicinity—not one-fourth of which cases were regarded as typhoid fever, and got well in spite of the treatment—the mortality should be *nil*.

It certainly argues (admitting the cases to have been typhoid) a lessened fatality of that disease in mountain regions. Recognizing the fact, however, as admitted by all clinicians, that no fever is more variable in its manifestations than typhoid, we must not regard the presence of any one symptom or sign, however "pathognomonic," as essential to the diagnosis of this disease.

In one case the eruption may be wanting; in another the typical temperature-curve or the initial diarrhœa, epistaxis, ochre-colored stools, or even the gurgling in the iliac fossa found so constantly in this disease; or there may be present almost obstipation, reduction of the pulse-rate, amounting to bradycardia, ecchymoses into the skin and areolar tissue, as seen in purpura hæmorrhagica; a remittent type of pyrexia, as seen in infantile remittent fever; a course of short duration, as though abortive, and of an ambulatory character.

Convinced in my own mind of the identity of these eruptive fevers (whether the eruption be papular or macular) with typical enteric fever of the authors, I called the attention of the commanding officer in my sanitary report for the month of May, 1895, to the prevalence of this fever, to its mode of propagation, and to the measures requisite for its prevention.

The following is an extract from that report, with the indorsement of the commanding officer thereon:

"Several cases of mountain fever, which in my opinion is typhoid fever, have appeared among the enlisted men and children of the garrison. This is a preventable disease, and should not spread epidemically. The remedy lies chiefly in protection of our water-supply from contamination with the infectious stools of typhoid cases; and inasmuch as this disease is among the Indians, and our water-supply may become infected by cases living in tepees along the South Fork (one case having already occurred along that stream), it is advisable as a precautionary, preventive measure that the Indian agent be requested to remove, temporarily at least, all tepees situated along the South Fork I believe it would be perfectly practicable, if the Chamberland filter could be utilized, to furnish water perfectly free from disease germs to all members of this command, and under military restrictions to prevent the drinking of other waters until within a short time (the Indians being removed from along South Fork) that stream would purify itself, and this fever would disappear from the garrison. It is recommended under the circumstances that water be boiled in the barrack quarters and put in a clean cask and cooled with ice, if necessary, and used by the enlisted men as drinking-water exclusive of any other."

Indorsement. A letter, copy herewith enclosed, has been sent to the acting Indian agent, requesting him to remove all tepees from the banks of the South Fork:

"A circular has been issued directing the commanding officer, Company F, Eighth Infantry, to have all the drinking-water used in his company boiled before the men are allowed to drink it, and recommending that officers, their families, the families of enlisted men and civilian employes, take the same precaution with regard to their drinking-water."

The exclusive use of water sterilized by boiling for potable purposes by the members of this garrison was begun on the afternoon of May 31st; and it is a significant fact that no further cases developed later than four days subsequent to the use of boiled water for drinking purposes, when we consider that the shortest probable incubative stage of typhoid fever is seven days, and its usual incubative period is from ten to twenty-one days.

In none of the eruptive cases recited in this paper did herpes labialis occur; in none was there a history of a previous attack of typhoid fever, and yet in this vicinity there are a number of individuals who have had typhoid fever in the East and elsewhere, and were exposed to the same influence under which others succumbed to this mountain fever.

The four cases that occurred in April and were provisionally diagnosed malarial remittent fevers I am now inclined to regard as genuine typhoid cases, and the subsequent attack of Fabianski's, as recorded on thermometric chart No. 2, and setting in about ten days after subsidence of the primary attack, might consistently be regarded as a relapse.

One of the most striking features in these cases, as indicated on the charts, is the bradycardia or slowness of the pulse-rate. This is not

uncommon in the course of continued fevers, and is usually regarded as an indication of exhaustion of the cardiac muscle, but bradycardia was noticeable very early in these fevers, and certainly before any degeneration of the heart-muscle could take place through changes incident to hyperpyrexia or prolonged pyrexia, and it will be observed in Parker's case (chart No. 4) that the temperature seldom rose above 99° F., and yet bradycardia was well marked, while there was hardly any apparent loss of muscular strength or wasting of the body tissues; and again, in the case of Dave Adams (chart No. 5) the pulse on the evening of June 8th registered fifty-two beats to the minute, and yet four days previously he was sufficiently active and strong to rope and throw a young broncho for the purpose of having the horse's eye operated. In the mean time he had had two days of moderate remittent fever and two of slightly subnormal temperature.

All these slow pulses are regular, soft, and full, and show no tendency to dirotism. Digitalis was the remedy par excellence in bringing these pulses up to the normal.

While the mortality among the whites has been *nil*, that among the Indians has been, what might be expected in typhoid cases among them, attended pretty generally with purpuric spots, viz., 18.6 per cent.

The Indian's "sick ration" consists of bacon, coffee, and sugar, which are not conducive to the soothing of ulcerated patches of intestine, and are, therefore, better withheld in this disease if a dietary better suited to the condition could be procured.

The purpuric spots accompanying this disease among the Indians in many cases are probably due to some dyscrasia of the blood induced by a too restricted and unvaried dietary and unhygienic surroundings.

Their cases have been regarded and treated as purpura, as also twelve out of the sixteen cases kindly furnished me for this report by my friend, Dr. Callaway; and while I regard all these cases as typhoid fever, the lack of unanimity in our opinions upon the matter only serves to emphasize the wide divergence of these fevers in their clinical manifestations from those features commonly met with in typical cases of typhoid fever. The practical import of a correct diagnosis cannot be lost sight of. If these cases are typhoid, the old adage of "an ounce of prevention" is eminently applicable. If they be cases of purpura or of fever *sui generis* in their nature and unknown to the profession at large, the *onus probandi* lies with those who so declare.

THE NATURE AND TREATMENT OF SPASMODIC TORTICOLLIS.

By G. L. WALTON, M.D.,
OF BOSTON.

SPASMODIC torticollis is a disorder of the cortical centres for rotation of the head.

Suppositions pointing to peripheral, spinal, and bulbar disturbance may be dismissed with passing notice. The nerves are found normal. The theory of Tilleau, assuming lack of balance in the cervical muscles, as well as that of Charcot, assuming hypertrophy of certain muscles through atrophy of others, hardly reaches the real seat of disturbance, as De Quervain comments, for we have still to explain the origin of the lack of balance and the muscular atrophy. The theory of Charcot lacks also clinical confirmation.

Nuclear origin may be at once eliminated when we remember the wide distribution of the areas on different sides and in different segments of the cord which must be associated to produce the typical case of spasmodic torticollis.

In the cortex alone are these movements intimately associated in the so-called centres for rotation of the head.

The nature of the disturbance is not so readily determined as its seat. Indeed, the pathogeny of associated spasm in general offers, as so profound a student as Erb affirms, one of the most complicated problems in neurology.

Brissaud apparently deems rotatory tic a mere mental phenomenon—the result of an irresistible impulse. In support of this view he adduces the fact that the simplest movement of the patient, *e. g.*, putting the finger to the chin, may sometimes check a spasm so severe as to resist the most forcible opposition from another person. A voluntary has here inhibited an involuntary movement, the result of a psychomotor hallucination. It is, however, true that a sneeze may be inhibited by passing the finger lightly upon certain points about the nose, but it does not follow that a sneeze is a purely mental phenomenon. Psychological or physical, the impulse is beyond the voluntary control of the sufferer, and the patient presenting the most marked case of easily inhibited spasm which has come under my observation resorted eagerly to most extensive operation upon muscles and nerves in the hope of relief.

Patients suffering from this malady, though generally of neuropathic make-up, are not especially prone to present the mental peculiarities or other stigmata of hysteria. My experience does not show the association with epilepsy mentioned by certain authors.

The proposition that gross organic lesion, such as is occasionally found

in facial tic, is present with any frequency in spasmodic torticollis is hardly to be seriously considered, though it is by no means improbable that in the affected areas of the cortex a certain degree of cytolysis is present. In fact, in view of Van Giessen's recent communication, the possibility of a selective autotoxin must be borne in mind in this affection, as in tetany. One case, indeed, has been directly traced to malarial poisoning, and has succumbed to the use of quinine (Simon).

Whatever the exact pathogeny of the process, it would seem that long-continued habit may finally merge into spasm, as in the case of the patient (cited by Gowers) who, for twenty years, had nodded violently in conversation. Closely allied is the overuse of certain muscles of the neck, as illustrated by the weaver who had constantly to rotate the head rapidly at her work (Annandale).

Neurotic heredity certainly predisposes to this malady, and the usual causes of neurasthenia—overwork, anxiety, and depressing emotions—favor its inception. The sufferers are rarely robust. De Quervain cites the case of a person who for some time held the head in one position on account of a furuncle on the neck, and argues that the long-continued overuse of the centres of rotation produced here an irritability which caused continuance of the movement. The furuncle itself would certainly point to a debilitated condition which might well decrease the power of inhibition.

Performers on musical instruments have become subject to spasmodic torticollis, doubtless from overuse of certain muscles.

Among the commonest causes for malpositions of the head the most worthy of attention is ocular defect, whether from refractive error or muscular insufficiency. This variety of irritation as a mere reflex source of spasm has been curiously overlooked in discussions not only of torticollis, but of facial tic, which begins almost invariably in the lid, and has always seemed to me primarily an involuntary effort to close the eye, the spasm extending later to the other facial muscles.

Leaving to one side, however, the question of reflex excitant, we cannot overlook the fact that oblique astigmatism and muscular insufficiencies are particularly prone to cause a *habit* of tilting the head to one side or the other, thus producing the lack of balance of Tilleau and the excessive movements of De Quervain and others.

Not only is this supposition reasonable from an *à priori* point of view, but facts tend to bear out the conclusion that ocular defect may be, in certain cases at least, the exciting cause of spasmodic torticollis in neuropathic individuals.

The fact that this spasm, like facial tic, writer's cramp, and allied neuroses, disappears during sleep, would certainly indicate that the central irritability is connected with some effort of the waking hours, of which use of the eyes is among the most constant.

The age of onset, generally from thirty to forty years, is curiously suggestive in that this is the age of greatest accommodative effort.

A noteworthy case is that noted by Dr. Chandler: A patient with oblique astigmatism was given by mistake a plus spherical glass with minus cylindrical element added in place of plus cylindrical, thus increasing his astigmatic error. After wearing the glass for about five years a spasmodic torticollis was established of sufficient severity to require operation.

Relief of malposition and of incipient torticollis has been noted by oculists. This branch has not yet been studied sufficiently to enable us to formulate an absolute opinion, but is worthy of consideration in view of its practical bearing on the early correction of refractive errors.

In any event, torticollis once fully established cannot be cured by correcting such errors.

COURSE. The course of the fully developed disease is most melancholy; more and more muscles become involved, pain sometimes most severe ensues, the patient becomes unable to take part in any occupation or to take any pleasure in life.

MUSCLES AFFECTED. The muscles most commonly affected are the sterno-mastoid, the trapezius, the splenius capitis, the complexus, the trachelo-mastoid, and the inferior oblique. In the majority of cases the spasm attacks the sterno-mastoid of one side and the posterior rotators of the other, these muscles all combining to rotate the head in the same direction, the head being meantime tilted rather backward than forward on account of the greater power of the posterior group. In a small proportion of cases the sterno-mastoid alone is affected. In a still smaller proportion of cases the sterno-mastoid and posterior rotators of the same side are involved, the head being tilted without rotation toward the affected side. An occasional case is met with in which the posterior muscles on both sides are affected, the head being drawn directly backward (retrocollis). Rarely both sterno-mastoids alone are affected. In an occasional case these typical positions are varied somewhat, as, for example, by implication of the platysma myoides, the chin being drawn down on the affected side.

TREATMENT. The treatment of this distressing affection by drugs, as demonstrated by Noble Smith some years ago, has proved absolutely ineffectual. Electricity has accomplished nothing, and mechanical support, occasionally furnishing some relief, especially in recent cases, is, as a rule, intolerable. Correction of refraction in advanced cases accomplishes little or nothing. The continued rest cure has proved unsatisfactory in the only case coming under my observation. Persistent massage seems to have been useful in certain cases; it should be tried before resorting to operation, unless the case is so well advanced and distressing that further delay seems an injustice to the patient; it

should be used also in those cases in which the patient objects to an operation.

OPERATIVE TREATMENT. Coming to the question of operation, simple section and stretching of the nerves have proved of too temporary relief to justify the postponement of more radical measures. The only operations to be seriously considered are resection of the nerves and section of the muscles.

In an occasional case resection of the spinal accessory nerve will accomplish a cure, even though the spasm has extended beyond the muscles supplied by this nerve. In the vast majority of cases, however, the opposite result will obtain, and the spasm will afterward extend to the posterior muscles, even though it was at first limited to the sterno-mastoid. It is in all cases wise to perform this operation first, and perhaps to perform section of the sterno-mastoid, partly in the hope that the case may be one of the exceptionally favorable, and partly because it is well to divide the operation in case the sterno-mastoid is affected on one side, and the posterior rotators on the other. In an exceptional case, in which the sterno-mastoid and posterior rotators are affected on the same side, it will be found wise to perform the whole operation at once, as was done by Dr. Richardson in an intractable case of this variety, in which perfect and permanent cure has followed section of all the muscles, together with resection of the spinal accessory nerve and the posterior branches of the three first cervical nerves.

Before recovery can be expected it will be necessary, in the majority of cases, to resect at least the spinal accessory nerve on one side, and the posterior branches of the three first spinal nerves (an operation in which Keen was a pioneer) on the other. It will be wise in the majority of cases to cut the affected muscles also.

Cutting the affected muscles alone, as practised by Kocher, seems to give a good percentage of recovery after such operations (seven in twelve); the muscles to be cut, if we follow his plan, are the sterno-mastoid, trapezius, complexus major, complexus minor (trachelo-mastoid), and obliquus inferior. According to the theory of De Quervain, this operation acts upon the cerebral centres for rotation in a suggestive way; in other words, spasmodic rotation having been prevented for a certain length of time by the operation, it does not recur after operation, perhaps in part because the muscles have been weakened, but more particularly through so-called suggestion to the central nervous system. It is hard to see why muscle-section should impress a more vivid suggestion upon the centres of rotation than nerve-section, and after the latter operation spasm almost invariably recurs. It certainly seems safer, in case muscle-section is performed, to resect also the nerves supplying those muscles. This combination has been accepted and practised to a certain extent by Richardson.

PROGNOSIS. As regards the hope of recovery, most patient and persistent effort will be required, both of the patient and the surgeon, a number of operations being necessary in the average case before such recovery can be effected. Even then we can hardly expect an absolute cure in much over 50 per cent., amelioration in a somewhat greater number, while absolute failure will have to be recorded in a certain proportion; absolute failure will generally be largely attributable to lack of perseverance. It is a question if we have not erred up to this point in the direction of conservatism, and it is not improbable that the time will come when it will be considered advisable in the most intractable and distressing of these cases to remove all the muscles which Kocher has mentioned on *both* sides, and to cut both spinal accessory nerves as well as the posterior nerve-roots on both sides. The experience of Gardiner shows that the head can still be held upright after removing all these nerves, at least, and even if it could not, this affection in its most obstinate and distressing form renders the sufferer so valueless and miserable that he would even choose complete inability to hold up the head, requiring the use of a collar, in preference to remaining in his present condition. I have myself put this question to several patients and received this reply.

With regard to the muscles which maintain the position of the head and carry on the movements after operation, it would seem that the head is flexed by the anterior recti, rotated by the anterior and posterior recti, and tilted by the lateral recti and superior oblique. As regards retroflexion of the head, the posterior recti, if spared, are able to accomplish this movement, as De Quervain has pointed out, after muscle-section. It is a little harder to see what muscles retroflex the head after the posterior branch of the first cervical nerve has been removed, thereby paralyzing these muscles. It seems not impossible that the lateral recti succeed in performing this movement through their insertion into the jugular processes, which are situated somewhat posteriorly to the axis of motion, the muscles running back to this point from their origin at the anterior edge of the lateral processes of the atlas. They are not credited with this action in any anatomy I have consulted, so that this suggestion is offered with considerable hesitation, especially considering the poor leverage possessed by these muscles.

Great as the progress already made toward the relief of this most distressing and obstinate affection, the subject has by no means been exhausted, and accurate reports of operations and results are desirable. Sufficient material has, however, been accumulated to establish the fact that it is in the direction of operation that the most definite results are to be expected in well-established cases, and we are justified in the expectation that the percentage of cures may be materially increased by persistent effort.

INFANTILE MYXŒDEMA.

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THE doctrine which teaches us the value to the economy of the secretions of the ductless glands is comparatively recent; but from it we have already learned that organs like the thyroid and adrenals, hitherto almost overlooked, subservise physiological functions of great importance. Among the many great achievements of this great century may surely be ranked the benefits which humanity has already received from the recognition of this doctrine. The case reported is a living exemplification of this wonderful discovery—the principle known as *organ therapy*. This paper professedly deals only with infantile myxœdema, but reference to the adult and allied forms cannot be avoided. We recognize a congenital and, if you will, an acquired type of the infantile variety. The former are all born with absent or atrophied thyroids—not developed. They present marked symptoms *at birth*, including peculiar shape of head, premature ossification of the basi-sphenoidal juncture, to which Virchow called attention, imbecility, etc. Horsley also describes an intermediate form, the symptoms of which develop *shortly* after birth; the child is able to live, and a goitre is usually present—*i. e.*, *all thyroid tissue is not destroyed*. The most interesting types, however, are the sporadic, to which my case belongs, and the endemic. These children seem perfectly normal at birth and for some time thereafter, when suddenly, at about the age of six months (rarely before this), as in my case, one, two, three, or four years, or even later, the disease becomes manifest. Cases are considered sporadic which occur between the ages of six months and puberty.

ETIOLOGY. Heredity, pregnancy, consanguinity, alcoholism (especially drunkenness at the time of the procreative act), syphilis, water, climate, soil, etc., have all been considered as predisposing causes. As for my case, none of these were operative. The parents are in no wise related; were total strangers before marriage; nor does either come from a locality (both are foreign-born) where cretinism is endemic. *No history of goitre* can be elicited in either parental line. Alcoholism and syphilis can be definitely excluded. The child was born in this city, and though our water and soil may be responsible for other diseases, I am not aware that they produce cretinism. We know very little as to predisposing causes. One curious fact is that healthy children sometimes become cretinous if they move into a section where cretinism is endemic. Fagge long ago resolved that heredity was an important factor, and said that when both parents were goitrous, cretinism was very apt to follow in the second or third generation.

The history of this affection is so intimately interwoven with that of the adult variety, and finds such detailed description elsewhere, that I shall but barely allude to it. Only gradually did the evidence accumulate which proved that myxœdema was but a symptom which always accompanied the cretinoid state, whether it occurred in childhood or in adult life. Even the name myxœdema is probably not well grounded. In 1873 Sir William Gull commented, for the first time (*Transactions Clinical Society, London*), upon a cretinoid state supervening in adult life in women, but offered no explanations thereof. Ord in 1877 published a paper (*Transactions Royal Medical and Chirurgical Society, London*), in which he reported five cases similar to Sir William Gull's, and for which, because the chemical examination of the œdematous subcutaneous tissue revealed an excess of mucin, he proposed the name of myxœdema. The theory advanced by Ord, in explanation, was rather ingenious if not adequate. "Certain substances which normally are not formed, or, if formed, are as rapidly absorbed, are no longer disposed of, but accumulate in the skin. Not only are the sweat-glands rendered inactive by this mechanical hinderance, but all eliminative cutaneous function is in abeyance. The terminal nerve filaments being embedded in this new material, peripheral stimuli are no longer conducted to the cortical centres; these stimuli, wanting these centres, become inactive; a sort of atrophy from disuse follows." Thus Ord accounts for the hebetude and psychical torpor and for the general lowered metabolism.

Surgery involuntarily contributed, by a boldness which after experience proved a blunder, much valuable information to the etiology of this subject. Reverdin was the first to describe the cachexia strumipriva or thyreopriva—as Horsley suggests—*i. e.*, the peculiar cachexia and imbecility which were observed after removal of the thyroid gland for various reasons. Kocher in 1883 also described this alarming operative sequel. It was reserved for Semon, however, basing his reasoning upon deductions from Horsley's animal experiments in conjunction with the condition observed in man after surgical removal of the thyroid gland, to suggest that it was the *loss of this organ* which was always responsible for the myxœdema. The identity of infantile and adult myxœdema was asserted in 1888 by the committee of the Clinical Society of London in their elaborate and exhaustive report on myxœdema, from which I quote as follows: "That there is strong evidence that myxœdema, sporadic cretinism, endemic cretinism, cachexia strumipriva, and operative myxœdema of animals are, severally, species of one genus, and that such clinical differences as exist between them are due to causes already sufficiently set forth, and that the one pathological factor common to all these conditions is the occurrence of morbid processes or of operations involving the annihilation of function of the thyroid body." In this storehouse of information

are also found the results of Horsley's experiments on animals, which went so far to prove the importance of the thyroid to the economy. Animal experiments since performed by many, among others Gley and Murray, confirm all the earlier claims. In animals, as in man, when myxœdema does not follow operations, it is either because some thyroid tissue has been left behind capable of enough subsequent growth to properly represent thyroid function, or accessory thyroids were present, as is almost the rule in animals. Negative results are due to many causes, such as lack of care, sepsis, and especially exposure to cold, for the myxœdematous animal, like the myxœdematous human, *cannot endure the cold*. These cases always improve somewhat in summer and get worse in winter.

Whatever may be the nature of the predisposing cause, in discussing the pathogenesis of infantile and adult myxœdema and their congeners, our entire attention may be focussed on one organ alone—the thyroid gland. There is hardly need to recount the evidence going to prove that upon absence of this organ, or upon some disturbance in its function, the whole pathological superstructure rests secure. In cases of congenital cretinism the gland is not developed or is atrophied, and, as in many cases no trace of thyroid tissue has been found, it is very probable that sporadic cretinism, too, depends upon atrophy or, to put it still stronger, upon absence of this body. Of endemic cretins it may be said that two-thirds *are* goitrous, and of the remaining third that there is kinship with some goitrous, even though non-cretinous, person (Curling, 1850). In other words, the thyroid gland may be present, but its presence *by no means indicates that its secretion is healthy*. Any change, therefore, in the thyroid secretion which produces an alteration quantitatively (in the sense of diminution), or qualitatively in the sense of a departure from the normal physiological standard, probably *in the direction of lowered potency*, is apt to be followed by conditions of which cretinism is one expression and myxœdema another. Absence or atrophy of the gland, interstitial inflammation with subsequent destruction of secreting structure, cystic degeneration, as also operative removal in man or experimental ablation in animals, may all be followed by the diseases before described.

Our knowledge soon finds a barrier beyond which at present we cannot pass when we attempt to account for the marvellous influence of this little body. Of its real function nothing positive is known. By some the gland is associated with hæmatopoiesis. Horsley observed marked anæmia after ablation in dogs and cats. He does not claim, however, that the anæmia is the direct result of the ablation, nor would this claim, in my opinion, deserve defence. Depraved nutrition and lowered metabolism are nowhere better shown than in myxœdema, and malnutrition and anæmia are too often coexistent elsewhere to excite partic-

ular comment. One thing is positive: none of the internal secretions, the seminal fluid excepted, rank the thyroid in potency. The changes produced in this little dwarf, both before and after the administration of the extract, sufficiently demonstrate this statement. Growth, the vegetative functions, locomotion, reproduction (for cretins, as a rule, are sexually impotent), and those faculties which raise man above the brute—thought, speech, and intellect—are all profoundly influenced in a detrimental sense if this secretion be lacking. More wonderful still, if the absent thyroid material be supplied, we, in varying measure, counteract this malevolent condition and accomplish miracles that do not lack proof.

Probably the material furnished by the gland is an absolutely essential one, and all that we need to do is to supply this absent secretion from another source. Mendel thinks (*Deutsch med. Wochenschrift*, 1895, p. 101) that it may be the function of the gland to secrete a substance which, when present, prevents the formation of, or neutralizes, if formed, certain toxic substances. If the thyroid material be wanting, these hypothetical toxins accumulate and excite the symptoms already named. The administration of thyroid extract acts as does the natural juice, and can prevent such poisoning. I shall refer presently to the latest hypothesis in this connection.

Thus far we have been studying the effect of absence or diminution of thyroid juice, or of its loss in functional power, and have seen the resulting clinical picture. In the last few years we have begun to believe that we can have abnormal states dependent not only upon the foregoing, but upon *increased activity or altered quality* as well.

Upon the set of symptoms which supervene when thyroid extract is given has been conferred the name of *thyroidism*. The description of the symptom-complex which followed its administration in my case is almost typical for all the cases. Briefly, this symptom-group is composed of insomnia, restlessness, warmth of skin, tendency to perspiration, accelerated heart-action, mental excitability, quickened intellection, muscular twitchings, tremor, etc.

This picture has many features common to the physiognomy of that very enigmatic affection—Graves's disease. In speaking of Graves's disease I allude only to typical cases, not to the cases of so-called surgical Graves, nor to those known as pseudo-Graves, nor to the well-defined *formes frustes*, cases which are more or less temporary.

Graves's disease, when it merits the name, is always accompanied by some change in the thyroid gland. Because of this constant implication of the thyroid in Basedow's disease, because of the marked resemblance between thyroidism and the symptoms of exophthalmic goitre, as well as on account of certain evidence of an histological and physiological nature, a most interesting theory has been advanced. This theory desires

to maintain that two distinct diseases may be brought into direct pathogenetic relationship with changes in the thyroid gland. If the secretion have suffered diminution in any sense, we have learned to expect myxœdema or cretinism; but if the amount of thyroid material poured into the blood be in excess, or, if not in excess, such alteration in quality has occurred as shall be equivalent to an increase in functional activity, then exophthalmic goitre will be produced. This is the so-called thyroïdal theory of Graves's disease. Moebius, one of its most ardent advocates (*Zeitsch. f. Nervenh.*, 1891), thus contrasts the latter with myxœdema and cretinism: "In the one case we have enlargement, in the other diminution in size of the thyroid; here the pulse is rapid, there slow; the skin fine, warmer than usual, and inclined to sweat, instead of thick, cold, and dry; on the one hand, excitability, increased mental irritability, irritable weakness; on the other, slowness and dulness of mind."

Myxœdema and cretinism and exophthalmic goitre are, therefore, antithetic affections; in the former, there is what has been termed an *athyroidation*, in the latter a *hyperthyroidation* of the system. As for the pathogenesis of myxœdema and cretinism, that I consider fully established, but cannot consider myself as thoroughly converted to the thyroïdal theory of Graves's disease, although there is very much to be said in its favor. In the first instance, the literature records excellently attested cases, among others three by Baldwin (*Lancet*, January 7, 1896), where exophthalmic goitre has been present for some time, and has *gradually been replaced by myxœdema*, the assumption being that first there was increased activity in thyroid function—*hyperthyroidation*. The gland then gradually underwent interstitial changes, with progressive loss of secreting tissue until from insufficiency of thyroid juice *athyroidation* ensued. Graves's disease has also come on in cases of cystic goitre more or less slowly, and has, after a long time, given place to a myxœdema. Immediately after thyroïdectomy, or exothyropexy, when the glairy colloid material has exuded into the surrounding tissues, symptoms analogous to *thyroidism* have rapidly ensued.

Greenfield (*British Medical Journal*, 1896) has just shown that in Graves's disease there is an actual change in the histological appearance of the gland structure, the epithelial lining of the alveolar spaces becomes more columnar, and the secretion is no longer as colloid as before. Seductive as is the thyroïdal theory, it cannot explain all the cases nor account for all the symptoms. It is unable to explain the many instances where the disease comes on with great suddenness, after fright or emotional disturbance, for we can hardly attribute such cases to a sudden hyperthyroidation, although it is not entirely implausible that such a cause might so alter the nervous mechanism or vascular supply of the gland, especially in those of neuropathic stock, as to produce this condition with great acuity.

A very forcible objection is that the exophthalmos, and even the thyroid enlargement, often occur *unilaterally*, and it is surely difficult to conceive that the assumed toxic effect should be exerted otherwise than symmetrically. Notwithstanding Greenfield's observations, just cited, the pathological findings after operative interference in Graves's disease are rather at variance with the thyroïdal theory, for all sorts of lesions have been described, as well as *none at all*—in other words, the gland has seemed *perfectly healthy*. Still, a gland might *appear* healthy and yet actually contain an excess of toxic material. Putnam (*Brain*, 1894) is not willing to accept this theory as alone operative, and, while admitting that there is strong testimony in its favor, is inclined to attach much importance to disturbance of the emotional centres from various causes, as well as to direct excitation by the enlarging thyroid of the many vagus and sympathetic filaments which ramify so freely in this locality. Paul Marie is convinced that the *primum movens* is to be sought in some affection of the nervous system, by some assumed to be a *toxic neuritis* of the pons and medulla, from which irritative lesion an exaggerated activity of the thyroid may occur.

Maude (*Brain*, 1894), in a "Critical Digest," concludes as follows: "It is obvious that all over Europe there is a gradual growth of the opinion that this symptom complex is due to the production (or non-elimination) in the thyroid itself of some toxin which acts on the whole nervous system, even to the periphery, though the brunt of its action falls on the vasomotor and neighboring centres. The question of the exact rôle played by the thyroid change is difficult; it is clear that all morbid changes in the thyroid are not operative to produce Graves's disease, but all the cases (in which the gland has been properly examined) show two common factors—cell proliferation and diminution of colloid. Even so, we are in the dark as to whether the morbid change is primary or secondary to some vasomotor disturbance elsewhere, and also as to whether the alteration in thyroid secretion will produce the same effect in a healthy nervous system. Probably some nervous systems are more susceptible than others to the toxic influence, just as they are to alcohol and lead; in fact, the susceptibility of young women to plumbism and Graves's disease is strikingly similar."

Personally, I venture to assert that the relationship existing between Graves's disease and some toxic activity of the thyroid secretion is a fact too evident to be lightly thrust aside. I doubt very much if mere increase in quantity of the secretion can produce Graves's disease, for the giving of thyroid extract in healthy subjects is only followed occasionally by symptoms resembling it. Furthermore, if mere excess of juice were causally active, then the introduction of *more thyroid extract* in the way of relief would not only be absolutely contraindicated, but *positively harmful*, and yet there are numerous cases reported which have

undoubtedly been benefited by the thyroid treatment. If we assume, however, that it is not such quantitative increase, but that a qualitative alteration is brought about, rendering the juice, in some unknown way, *toxic*, we have a very plausible working theory. In that case the favorable influence of thyroid therapy is explicable, as follows: The gland may stop secreting the abnormal natural juice in the presence of the efficient substance, or the healthy animal extract may neutralize the toxic effect of the unhealthy natural substance, or, lastly, the economy may utilize the normal extract, and thus so fortify the system that its own abnormally altered secretion no longer exerts any deleterious influence.

With respect to the more recent explanations of the function of the thyroid and of the real nature of the active therapeutic principle contained in the thyroid extract, I should like to add a few words. Hutchinson¹ has just made a careful chemical examination of the glands. He found various substances which he could class together under two main groups—a proteid and a proteid-free group—both of which he obtained as watery extracts. Of these two only the proteids were therapeutically active. This group could be further resolved into a colloid substance and a nucleo-albumin, and of these two *only the colloid was active*. The colloid matter, therefore, is considered by Hutchinson as *the active ingredient*, and as it contains considerable iodine in organic combination, he considered his substance identical with the so-called *thyroidin* first isolated and described by Bauman.² Bauman has examined the thyroids of sheep, pigs, and men, and found them all to contain iodine to the extent of 0.2 to 0.5 per cent., and iodine was present in his active principle, *thyroidin*, to the enormous extent of 9.3 per cent. I thought it might interest you to have the presence of iodine demonstrated. I have prepared six B. W. & Co.'s thyroid tablets according to Ewald's method.³ By means of this procedure the iodine is freed, and when shaken with chloroform separates out, as you now see, as a beautiful violet fluid. The function of this gland may thus be to abstract iodine from the food where it is present in infinitesimal quantities, to store it up in its interior, and to furnish it to the system as it may be needed. In view of the fact that iodine has always been probably the most reliable remedy in goitre, the discovery of this element in organic combination in the gland itself becomes peculiarly interesting. But one word more with reference to infantile myxœdema. The point of greatest interest in this connection is, will the cases keep on progressively improving, or do they reach a certain point, and then remain stationary? The impression made on me by my case, and for this reason I have delayed reporting,

¹ British Medical Journal, March 2, 1896.

² Zeitschr. f. Phys. Chemie, No. 4, 1895.

³ Berlin. Med. Gesellsch. in Deutsche Med. Wochenschr., No. 5.

is that persistence in the treatment will probably be rewarded by a slow but continuous improvement. Where the diagnosis can be made before the second year of life the prognosis will be infinitely better than in more advanced cases. He who makes the diagnosis in early life, and persists continuously in the treatment (for relapses may occur), may even hope to see the germs of thought bud into the beautiful flowers of reason in what was before "the leafless, barren desert of the idiot's mind."

Barbara S., born March 9, 1890, was first seen by me at the Children's Clinic of the Medical College of Ohio, on November 15, 1894. The case-book shows the following record:

Age. Four years and six months.

Family history. Negative as regards the parents. One child died of diphtheria, and one of tubercular meningitis(?).

Past history. Has had trouble with bowels for some time. Poor appetite. First teeth appeared at age of fourteen months. Nursed until two years of age by mother, after that cow's milk.

Present history. Principal diet is milk, also occasionally eggs and crackers. Abdomen protruding; teeth decayed. The child *has never walked*, has always been badly constipated. Anterior fontanelle wide open.

November 19, 1894. Examination (Wolfstein). Upper four incisors and molars badly decayed, all the others very imperfect, the canines pointing through the gums. Glands of neck slightly enlarged; a scar on the left side being evidently a cicatrix from an old open gland. Some slight enlargement of radial epiphysis on both sides; rachitic rosary not present; Harrison's groove well exemplified.

Head. Somewhat square; anterior fontanelles quite patulous; bones soft.

Abdomen markedly protruding; veins distended. Inguinal glands not enlarged; liver and spleen slightly enlarged.

Extremities. Tibiæ very slightly curved; heads of same enlarged. No history of bronchitis, nor of laryngo-spasm.

Skin is markedly anæmic.

This case was, of course, rachitic, but there were additional features which pointed in an entirely different direction. Without stopping to emphasize the points of difference between rachitis and the disease suspected, I shall rapidly review the conditions which led to the correct diagnosis.

(a) *The facial expression.* The head and face appeared rather large and swollen. The expression was one of impassiveness, of stolidity. The eyes, wide apart, had the vacant, dull stare which indicated the absence of intellection. The nose was flat, turned up at the end, while the bridge was depressed. The tongue was markedly thickened, so much so that the mouth could not contain it, and it constantly protruded. This protrusion added greatly to the general impression of imbecility. From the facial expression alone one may make the diagnosis; indeed, one is justified in claiming for infantile as well as adult myxœdema a *pathognomonic facies*. If you will compare the pictures in the various text-books with my case, Fig. 1, January, 1895, the remarkable resemblance between the various cases will become plainly manifest.

(b) The hair was coarse, thick, and of a hemp-like character.

(c) Above both clavicles were several prominent masses—the so-called supra-clavicular fat masses—common to both the infantile and the adult form.

(d) No trace of the thyroid gland could be found. All writers agree, however, that it is very difficult to absolutely exclude the presence of this body *by palpation*.

(e) The abdominal enlargement was very marked—it was the “frog-belly” of rickets somewhat intensified. Digestion was capricious; milk was tolerated, but poorly assimilated. Constipation of the most obstinate nature was the rule, stool only occurring naturally once a week, often not for two weeks. The stools were thin, clayish-yellow in color, and of a *horrible* odor.

(f) The measurements (see table, under heading January 15, 1895) show how dwarfed was the skeleton. The head always fell forward, and there was lateral wabbling due to weakness of the muscles and ligaments. A marked spinal curvature in the dorso-lumbar region (convexly backward) was noted, and is usually present in all cases.

That ossification was evidently very imperfect was evidenced sufficiently by the widely patulous fontanelle, still open at the fifth year. The bones of the arms and legs were stunted in growth, but the latter were not deformed, which is readily understood, for, no attempt at locomotion having ever been made, no weight had been placed upon them. The pelvis was not carefully examined.

(g) The skin was very pale, of a straw-yellow color. The anæmia was evident enough, but an examination of the blood showed H. 55 per cent. Erythrocytes 2,100,000, pale, no erythroblasts. The skin was dry, for perspiration had been in abeyance for years, even in the summer.

The temperature was *always subnormal*. The child was cold objectively and subjectively, and preferred the neighborhood of the stove. Superficial reflexes were absent.

(h) The hands and feet were large comparatively. The spade-like hands and feet are only typical for the adult type.

(i) The child will sit for hours in any position in which it may have been placed, stupidly looking around, never attempting to crawl, nor indicating by any act the possession of any intellect.

The diagnosis of infantile myxœdema was made, and thyroid feeding was clearly indicated. After carefully considering the literature I determined that no one of the various methods, such as (1) subcutaneous injection of the glycerin extract, (2) ingestion per os of the aqueous or glycerin extract, (3) ingestion per os of the thyroids, raw or slightly cooked, had any advantage over the simple administration of the dried powdered glands in tablet form. To-day I do not hold so religiously to this opinion, for in an obstinate case with the proper environments, I think I should try the glycerin extract made from glands removed aseptically, or feeding the fresh glands lightly broiled. At the very outset of the treatment I used Armour & Co.'s tablets, which seemed to be very active and quite satisfactory, but for the most part the tabloids made by Burroughs, Wellcome & Co., England, have been employed. Treatment was commenced late in January, 1895 (Fig. 1). One tablet (5 grains) was given three times daily. The effect was simply astonishing, I might almost say, alarming. The weight of the child fell from nineteen and one-half pounds to thirteen and one-half pounds within two weeks,

the densely infiltrated skin, which had previously stood out in thick folds, seemed to lose substance, the solid cedematous material literally melted away; the lines of the muscles, before obliterated, came into view. The prominent smooth abdomen became flatter, the abdominal muscles stood out plainly. The skin, which had been so cold and dry, began to be warm; the sweat-glands manifested a willingness to resume function, and for the first time in years perspiration covered the body. The effect on the nervous system was so marked as to give rise to some apprehension, but a very kind letter from Dr. Geo. W. Crary, of New

FIG. 1.



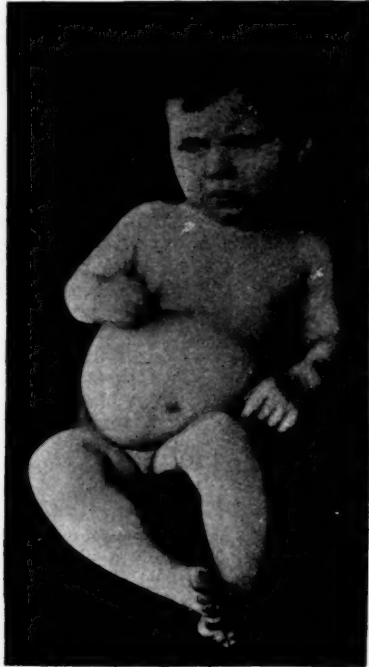
January, 1895.

York, whose authority in this field is recognized, reassured me. This child, which had formerly slept by preference, became exceedingly restless, all night long; the mother said its body jerked, its muscles twitched, and sleep was absent. With the greatest difficulty could I induce the mother to continue the treatment.

Marked diuresis was observed, and was the more noticeable as micturition had been rather infrequent, and the amount small. It was clear that the child was being profoundly influenced by some substance of

great therapeutic power, and it was deemed advisable to diminish the dose. Only one tablet daily was now given, and, indeed, whenever the dose has gone above one and one-half tablets daily, the condition produced has been *one of extreme excitation*. The temperature returned to normal, but no febrile reaction was ever observed. About the middle of February the child was taken down with a severe attack of bronchitis, so that treatment was discontinued. In April, 1895, the extract was again resumed, and since that time the improvement has been steady and satisfactory. In October, 1895, her condition was as follows (see Fig. 2):

FIG. 2.



September, 1895, after six months' continuous treatment.

The anterior fontanelle is almost completely closed, the face has a more intelligent aspect, the hair is somewhat softer; the child perspires freely. The gain in weight has been about seven pounds, in height about two inches. Attempts at articulation are made, though in this respect the progress is very slow. The tongue is held entirely within the mouth; the skin is warm, and there is some color in the cheeks. Blood examination shows: H. 70 per cent.; erythrocytes, 2,800,000. The child can now stand upright, and if supported takes a few steps. The constipation, which had been so obstinate, had really yielded after the second week of

treatment, and had now given place to diarrhœa, due to difficulty in controlling the diet and to the unfavorable surroundings. The mother was deaf to my most persuasive entreaties to allow the child to be removed to the Jewish Hospital. This I wished to do in order to determine the difference in metabolism as the child improved. These experiments have, however, been made sufficiently elsewhere. In January, 1896, on visiting the child, I found it eating the ordinary food of the other children (though milk is still its staple article of food), and to my delight the child was walking about unassisted. She is still unfriendly with strangers, easily frightened, and often very choleric without adequate motive.

FIG. 3.



April 16, 1896.

April 1, 1896. Found her playing with the other children; seemed quite contented; gave and took objects; shook hands; walked across the room to get a penny (surely a sight of awakening intellect); took note of her surroundings; played with the kitten, and all in all exhibited a degree of improvement which, when contrasted with her previous imbecility, might *justly be termed miraculous*. (See Fig. 3, showing the child standing entirely alone; also measurements taken at this time.) The child has walked two squares without being assisted. Speech is still very rudimentary, but is slowly being acquired.

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	1895,	1895,	1895,	1896,	Boston table,	
	Jan. 15.	April 29.	Oct. 15.	April 12,	Average for girls.	
					4½ years.	6 years.
Weight	19¼ lbs.	19¼ lbs.	26¼ lbs.	34¼ lbs.	38 lbs.	43 lbs.
Height	27½ inch.	28½ in.	30½ inch.	34½ inch.	40 in.	43½ in.
Circumference of head	17½ "	18 "	19½ "	20 "		
" chest (nipple)	19½ "	19½ "	20 "	21 "		
" abdomen	19½ "	18½ "	20½ "	21½ "		
Length { from base of neck	6¾ "	7 "	11¾ "	12¾ "		
" base of spine						
Length of leg	12¾ "	12¾ "	14¾ "	15¾ "		
" of arm to wrist	7¾ "	8 "	9 "	9½ "		
Blood	H. 55 p. ct. R. 2,000,000	70 p. ct. 2,800,000	80 p. ct. 3,100,000		

ON "DRY MOUTH," OR XEROSTOMIA.

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THE condition of "dry mouth," to which the term "xerostomia" was subsequently applied, was first brought prominently under the notice of the profession by Mr. Jonathan Hutchinson and the late Dr. W. B. Hadden in the year 1888. The disease must be an extremely rare one, as so very few cases have been recorded since that time. The features of the malady are marked, and cause so much discomfort to the patient that the cases would be likely to attract the attention of any observant practitioner, and the importance, also, of such a condition, as bearing upon the relation of the nervous system not only to the secretion of the glands of the mouth, but also to secreting organs in other parts of the body, is one which renders it desirable that cases of xerostomia should be recorded.

The following case is a well-marked instance of the affection, associated with which in this instance is an enlargement of both parotid glands:

Mrs. M., aged thirty years, was brought to me by Dr. Chadwick, of Heaton Chapel, on February 20, 1894. She complained of intense dryness of the mouth and of great discomfort arising therefrom.

Mrs. M. stated that she had been troubled with the dryness of the mouth for the past three years, and that it had come on after a slight febrile attack which she believed to be influenza. During the whole of the past three years the mouth had never been moist. The swelling behind the angles of the jaw she had also noticed for about three years, and it likewise had been present ever since; but was now somewhat less than it was twelve months ago. For about the same time she had been troubled with shortness of breath and palpitation and had been getting paler, but she stated that she never had had a fresh complexion. Pre-

vicious to three years ago she had enjoyed excellent health, and had never had any illness.

She had been married six years, but had no children, and had never had any miscarriages nor any stillborn children. There was no history of any syphilitic symptoms. She was one of a family of ten; three brothers or sisters had died in infancy; the other six, who were grown up and varied from twenty-two to thirty-five years of age, were all in excellent health. Her father, aged fifty-three years, was living and in good health; her mother died at thirty-eight years of age, two weeks after a confinement (up to the time of delivery the mother had had good health).

Mrs. M. was extremely anæmic; she was very nervous, and, in addition to the dryness of the mouth, she complained of palpitation. The dryness of the mouth was especially troublesome to her, and she said the dry burning sensation in the mouth was always there, but varied a little in intensity from time to time, and she had frequently to sip cold water to afford relief. Any acid drink or food, such as stewed rhubarb, caused her great pain, and, having tried many things, she found nothing gave her so much relief as cold water. Glycerin preparations caused considerable pain.

The tongue was absolutely dry and was much fissured. When I first saw her it was quite clean, but she said that it became coated with black sordes if she did not attend to it. The gums and inner surface of the cheeks were dry. The soft palate was dryish, but presented a little sticky mucus at various places. The posterior wall of the pharynx was distinctly granular. There was slight moisture there, but even that part was deficient in this respect. No affection of the mucous membrane of the mouth, except the dryness, could be detected; it was not unusually red. She had very perceptible enlargement of both parotid glands. The glands were not excessively large, but the enlargement was sufficient to be very noticeable on either side, and gave her the appearance of a person with a mild attack of mumps. The enlargement of the parotids was uniform, unaccompanied by any pain, and there was no tenderness on pressure. Each gland felt very dense and firm. The orifice of each parotid duct in the mouth was natural, and by firm pressure and massage along the course of the duct a very little glairy secretion, like tenacious mucus, could be squeezed from each duct.

No enlargement of the sublingual or submaxillary glands could be detected.

There was no affection of any of the lymphatic glands in the neck.

She had no teeth except false ones. She stated that she formerly had very good teeth, but that during the last few years, and she thought during the last three years, while the dryness of the mouth had been present, they had appeared to her to crumble away. She was quite certain that at the time of her marriage, six years ago, her teeth, with the exception of one, which she then had to have stopped, were very good.

The mucous membrane of the nose was somewhat, but not excessively, dry.

The taste, as might be expected in so dry a condition of the mouth, was very defective. She could not taste either quinine or saccharine on the front or back of the tongue on either side, even when the tongue was well moistened with water. When she swallowed she was able to taste

a little, but the sensation was so slight that I could not help feeling in doubt as to whether the defect of taste was entirely due to the present dryness of the mouth or whether it was not, possibly, due to some change in the nerves or their endings in the mouth. Neither asafœtida nor musk caused any sensation of smell in the right nostril, but they did to a slight degree in the left nostril.

The larynx presented no abnormality. The conjunctivæ were moist and, except being anæmic, were healthy.

No disease of the heart, lungs, or any other organ could be discovered. The blood was examined, but nothing more than what is found in anæmia was observed.

The urine was 1010 specific gravity, and contained neither albumin nor sugar.

The menstruation was regular, but somewhat profuse. (On account of the relation of enlargement of the parotids to affections of the pelvic organs, Dr. Chadwick, a few days later, made a specially careful examination of those parts, but was unable to find any disease of any organ in the pelvis.)

The skin was somewhat, but not excessively, dry. Mrs. M. stated, however, that she perspired very little, even in the summer.

The pupils were equal, and presented nothing abnormal.

The patient has been under my observation now for over three years. Arsenic, iron, iodide of potassium, and tincture of jaborandi were tried successively, but without any apparent benefit. A faradic current applied daily to each parotid gland, and each gland submitted to gentle massage, appeared to give temporary relief and to reproduce a certain amount of moisture in the mouth. Mrs. M., however, found so little relief from any treatment that for many months she has ceased to adopt any.

In the cases of "dry mouth," or xerostomia, which were brought before the Clinical Society of London about nine years ago by Mr. Jonathan Hutchinson¹ and the late Dr. W. B. Hadden,² the chief features were the arrest of the secretion of all the salivary and of the buccal glands, but there was no enlargement of the parotids. We have in the above case, however, in addition to the arrest of the buccal and salivary secretions, an enlargement of both parotid glands, a feature which has not usually been found in cases of xerostomia. About five years ago Mr. Jonathan Hutchinson published³ two cases of "relapsing parotitis," one of which was associated with well-marked xerostomia and the other with polyuria and a certain amount of dryness of the mouth. In the case above recorded we have not to do with a relapsing parotitis, but with a permanent enlargement of the parotids. Whether the enlargement is inflammatory or due to simple retention of secretion in the gland cannot be definitely stated, but the former is much more probable. This association of enlargement of the parotids with xeros-

¹ Clinical Society's Transactions, xxi. p. 180.

² *Ibid.*, p. 176.

³ "On Liability to Recurrent Parotitis with Xerostomia," by Jonathan Hutchinson, LL.D., F.R.S.: Archives of Surgery, April, 1892, iii. No. 12.

tomia is extremely interesting, but the explanation of it is not at first sight very evident.

In the records of the majority of the cases of xerostomia we have no mention of enlargement of the parotids, and in several it is expressly stated that those glands presented nothing abnormal.

In xerostomia, also, we have not only an arrest of the secretion of the salivary glands, but of that of all the buccal glands, so that an affection of the parotid glands or of all the salivary glands will not explain the features of xerostomia, in which condition the secretion of the mucous glands of the mouth is likewise arrested. The most probable explanation of the association of enlargement of the parotid glands with xerostomia is that both are due to a common cause and are not otherwise connected. It seems most probable that xerostomia is the result of a functional derangement of the nervous system, and that the same nervous affection produces in some instances a relapsing parotitis or a more permanent enlargement of the parotid glands. Unfortunately, this explanation does not carry us much further; we still have no idea of the cause of the functional nervous derangement, and cannot say with certainty what particular part of the nervous system is at fault. It is also obscure why the parotid glands, and not the other salivary glands, should be enlarged in some of the cases. The number of recorded cases where there has been an affection of the parotids associated with xerostomia, so far as I know,¹ is only two in addition to the one at present under consideration, a number far too few to allow of any conclusions being drawn.

The association of the parotid with other diseases does, however, seem to be a much more intimate one than the association of the other salivary glands with the same diseases. The cases recorded by Mr. Stephen Paget² of parotitis, both suppurative and non-suppurative, following injuries and diseases within the pelvis or abdomen clearly show that there is a connection between such injuries and diseases and the parotid glands, and the same connection does not appear to exist between the same diseases or injuries and the submaxillary or sublingual glands. It is impossible not to agree with the author that the most probable explanation of the cases of parotitis following injuries or diseases within the abdomen or pelvis is that it is due in some way to reflex nervous action.

In the case above recorded no disease of any organs can be found which, by any reflex action, might account for the xerostomia or for the enlargement of the parotids. The woman is, however, an extremely

¹ I have not included here a case where a temporary condition of dry mouth followed an attack of parotitis, recorded by Mr. H. St. C. Buxton, in the *Lancet* for 1883, p. 1087.

² "Parotitis after Injury or Disease of the Abdomen or Pelvis," by Stephen Paget, F.R.C.S.: *British Medical Journal*, March 17, 1887, also *Lancet*, 1886, p. 732.

nervous one, and the case appears to support the view that xerostomia is to be regarded as the result of a functional derangement of the nervous system.

The parotid enlargement is neither the cause nor the consequence of the xerostomia, but probably produced by the same nervous disturbance as that which causes the arrest of both the salivary and the other buccal secretions. As to what is the nature or cause of the nervous derangement, we cannot at the present time give any explanation, any more than we can explain the varied nervous disturbances which we meet with in neurotic individuals.

It is easy to understand the increase or diminution of the secretion of any gland under the influence of the nervous system, but it is not so clear how a functional derangement of the nervous system produces an enlargement of the parotids, such as is described in the above case. It is not probable that the enlargement is due to retained salivary secretion, because otherwise we should expect a similar change to be found in the other salivary glands, which are, however, unaffected except in so far as they have ceased to secrete. The enlargement of the parotids in the cases of injuries and diseases to the abdominal and pelvic organs is usually acute, and goes on to suppuration; but in a considerable proportion of the cases, where the termination of the case was recorded, the glandular affection resolved without suppuration.

We may therefore look upon those cases of parotitis secondary to abdominal and pelvic lesions as to a certain extent explanative of the enlargement of the parotids in some cases of xerostomia. In the secondary affections the enlargement of the parotids would be in some way affected by the reflex action of the nervous system, while in the cases of xerostomia we should have a primary functional derangement of the nervous system producing an arrest of the salivary and buccal secretions, and causing an enlargement, probably of an inflammatory nature, of the parotids.

It is noteworthy that nearly all the cases of xerostomia up to the present time recorded have occurred in people advanced in years, and, with two exceptions, all in the female sex. In the majority of cases the condition, at the time they were recorded, had existed many years, and, with the exception of pilocarpine, nothing had given much relief, and sometimes that had failed in this respect entirely.

The cases which I have been able to find recorded may be briefly here recapitulated:¹

CASE I.—Widow, aged sixty-five years. Duration, three years. Health good. Condition unrelieved at the time the case was recorded. (Mr. Hutchinson's case.)

¹ This list was made about three years ago, and I have not had an opportunity of looking up the literature since that time.

CASE II.—Widow, aged sixty-five years. Duration of condition at time of the report, seven months. Health good. (Dr. Hadden.)

CASE III.—A lady, aged sixty years. Duration, ten years. Health good. Condition unrelieved at the time of the report. (Dr. Rowland's case, quoted by Dr. Hadden.)

CASE IV.—A widow, aged fifty years. Duration, four years. Health good. Unrelieved at the date of the report. (Mr. Hutchinson's second case.)

CASE V.—A lady, aged seventy-seven years. Duration, eight months. Good general health. (Dr. A. G. Bartley's case, quoted by Dr. Hadden.)

CASE VI.—An old lady, who suffered from dry mouth during the last few years of her life. The cause of her death was not connected with her mouth trouble. (Dr. Barlow's case, mentioned by Mr. Hutchinson.)

CASE VII.—Lady, aged fifty-two years. Xerostomia, associated with recurrent parotitis, during twenty years, and also with recurrent pustular ophthalmia. Some slight improvement took place under treatment with jaborandi. (Mr. Hutchinson's third case.)

CASE VIII.—Lady, aged fifty-four years. Recurrent parotitis and attacks of polyuria associated with a certain amount of dryness of the mouth during two years. The case appears to be chiefly noteworthy as an example of recurrent parotitis and attacks of polyuria, while the features of xerostomia were not very pronounced. (Mr. Hutchinson's fourth case.)

CASE IX.—Widow, aged forty-four years. Duration, seven years. Patient succumbed to enteric fever. (Case recorded by H. Aretander, in *Ugeskrift for Læger*, 3 Mai, 1890; abstracted in *Centralbl. für Laryngologie, Rhinologie, etc.*, December, 1890, vii. Jahrg., p. 251.)

CASE X.—Case recorded by H. Summa in the *Alienist and Neurologist* for April, 1890. Except for a short abstract of this case (*Centralbl. für Laryngologie, etc.*, viii. Jahrg, July, 1891, p. 17), I have been unable to confirm it.

CASE XI.—Male, aged seventy-five years. Duration, at least four years, possibly longer. General health good. Pilocarpine relieved the condition. (Seifert, *Wiener klinische Wochenschrift*, 1889, p. 881.)

CASE XII.—Male, aged sixty-five years. General condition of patient good, but he was a very anxious and nervous fellow. Duration at least three years. Relieved by the persistent use of pilocarpine. (Seifert's second case, *Wiener klinische Wochenschrift*, 1889, p. 881.)

In addition to the above, several cases were briefly referred to at the discussion¹ on the subject of xerostomia, at the Clinical Society of London, by several of the members, as having come within their experience.

¹ Reported in the *Lancet* for 1888, p. 868.

REVIEWS.

GENITO-URINARY SURGERY AND VENEREAL DISEASES. By J. WILLIAM WHITE, M.D., Professor of Clinical Surgery, University of Pennsylvania; and EDWARD MARTIN, M.D., Clinical Professor of Genito-urinary Diseases, University of Pennsylvania. 8vo. pp. 1061, with two hundred and forty-three engravings and seven colored plates. Philadelphia: J. B. Lippincott Co., 1897.

At the present day, when genito-urinary surgery is making such rapid strides as a separate and distinct branch of general surgery, there must of necessity be a constant demand for an exhaustive treatise upon this branch of medicine. Such a work is the volume now before us, the size and completeness of which cannot but impress one with the fact that the genito-urinary surgeon of the present day occupies a position in the profession which is of dignity and importance second to none. This work, coming as it does from the hands of men eminent both as teachers and practitioners of genito-urinary surgery, cannot but rapidly become a standard book upon this subject, and deservedly so, as it is undoubtedly the most comprehensive and the ablest treatise on genito-urinary and venereal diseases before the profession in America to-day. One very great charm possessed by this book is, that, while being thoroughly scientific and up-to-date in every particular, it is at the same time practical in all of its details, as regards treatment; and the busy practitioner of medicine with very little time, or perhaps, inclination to wade through tedious discussions on theoretical matters, can here find the practical points that he needs most to aid him, quickly and easily, without having his mind befogged by long and confusing dissertations upon unestablished theories.

That this practical feature of the work was particularly in the authors' minds is indicated very clearly in the preface, where they say "that it was their wish to make this book one of practical use to the physician; much space has been devoted to symptomatology, diagnosis, and treatment, avoiding discussions of questions still unsettled."

This is the policy which will undoubtedly appeal most strongly to the general practitioner of medicine. On the other hand, the specialist, to whose lot it falls to unravel the hard and oftentimes knotty problems in genito-urinary surgery, will find, we are sure, this work an invaluable aid.

At the first glance over the book we are struck with the fact that the arrangement of the subjects is not that usually followed in text-books on genito-urinary surgery and venereal diseases.

The first and second chapters are taken up in discussing diseases and injuries of the penis and urethra. The succeeding twelve chapters are devoted to the three venereal diseases gonorrhœa, chancroid, and syph-

ilis. Genito-urinary surgery occupies the last half of the book. Considerable attention is paid in the first chapter to the operation of circumcision, the details of this little operation being given with an exactness and thoroughness which we do not recall having seen equalled in any article on this subject. The cuts illustrating the various steps of the operation are excellent, and to one needing help in performing this operation they would prove of great service.

Gonorrhœa and its complications in men and women are very ably handled in three chapters. In pursuance of the policy of the authors as outlined in the preface, no time is wasted in presenting all the conflicting testimony in regard to the gonococcus as the etiological factor in gonorrhœa. The position they assume is that gonorrhœa is an infectious disease, undoubtedly due to the presence in the urethra of the gonococcus. At the same time, it is admitted that it is possible to have a urethral inflammation, with abundant discharge, which does not depend upon the gonococcus, but is due to the entrance into the urethra of ordinary pus micro-organisms.

Three forms of urethral inflammation are described: 1. Infectious urethritis, or true gonorrhœa; 2. Non-infectious or simple urethritis; 3. Subacute or catarrhal gonorrhœa. Under the form last mentioned, there is described a subacute infectious urethritis characterized by scanty, muco-purulent discharge with few gonococci, no subjective symptoms occurring in the urethra, the mucous membrane of which has been permanently damaged by one or more previous attacks of gonorrhœa.

Under the head of acute posterior urethritis we note, with pleasure, the space devoted to the discussion of the importance of the two-glass test in determining the presence or absence of total urethritis. This point, the value of which is so little understood by the general practitioner of medicine, is ably brought out on page 102, and should be carefully studied by all physicians undertaking the treatment of gonorrhœa.

In taking up the subject of the treatment of gonorrhœa, attention is first paid by the authors to the abortive treatment of the disease by injections of nitrate of silver; this is considered as having a very limited use, being applicable in but few cases.

Two general methods of treatment are discussed at some length. First, the use of internal medication, combined with the employment of hand injections by the patient. Many excellent formulæ are given, all of which will be found most useful in the treatment of the disease by this method. The second form of treatment considered is that of copious urethral irrigation. While pointing out all the undoubted merits which this method possesses, the authors frankly admit that it also has great disadvantages—namely, that the performance is time-consuming, the apparatus cumbersome and likely to attract attention. These objections are weighty, and, in the long run, will prevent this plan of treatment from being universally adopted.

In the treatment of chronic urethritis the writers emphasize two points particularly, viz.: the dilatation of the urethra by the passage of full-sized sounds, and the cure of the chronic urethral catarrh by copious irrigations of nitrate of silver. As regards the use of the urethroscope in the treatment of this condition, attention is called to the fact that it should rarely be used until the urethra has become accustomed to the use of instruments by the previous passage of sounds;

and in these cases, where, as so often happens, its use is followed by increased discharge, we are advised to abandon the instrument altogether.

Chapter VI. deals with stricture of the urethra, and is, in our judgment, one of the best chapters in the work. Stricture of the urethra is considered to be due not only to a chronic contracting peri-urethral inflammation, but also, as pointed out by Harrison, to constant urine leakage through mucous membrane denuded of epithelium. We are pleased to note that the Otis scale is not adhered to in restoring the urethra to its normal calibre, the writers being of the opinion that the urethrometer, employed according to the method devised by Otis, merely demonstrates the extent to which the urethra can be distended.

It is an additional gratification to note that, with some few exceptions, gradual dilatation is recommended as the treatment to be preferred in all strictures. Internal urethrotomy is reserved only for fibrous or resilient strictures anterior to the bulb. For dense, unyielding strictures in the bulbo-membranous region external urethrotomy is advised.

A part of Chapter VII. is devoted to the best methods of keeping and taking care of urethral instruments. This is a constant source of trouble and anxiety to a genito-urinary surgeon, and it is only surprising that the matter has received so little attention in previous text-books on genito-urinary diseases.

In discussing the question of the etiology of chancroids, it is interesting to note that the authors incline rather to the opinion that chancroid is due to a specific virus of its own. This appears to be the trend of thought at the present day among those having the most extended experience in venereal diseases.

The section devoted to syphilis, occupying six chapters, is, to our mind, the ablest in the work. Want of space in this review forbids our calling attention to little more than the comprehensive way in which this subject is handled. There are, however, a few points which seem to us to be worthy of special note. The first of these is the complete table on pages 314 and 315, comprising the differential diagnosis between chancroid, chancre, and herpes.

Such a table cannot help but be of the greatest service to the general practitioner. The same commendation may be given to the tables giving the differential diagnosis in sub-preputial or concealed disease, and also the diagnosis between urethral chancre and gonorrhoea. Another most excellent feature to which we desire to call attention is the table on page 336, giving the general distinguishing features of all syphilides or eruptive skin lesions. Again, the classification of these lesions, on page 342, is worthy of special commendation, by reason of its great simplicity. Under the head of Syphilis and Marriage, it is interesting to note that the authors, while believing that in the great majority of cases syphilis can be cured, state, however, very positively that there is no absolute safety, as regards transmission of disease to the offspring, until four years of steady treatment have been undergone. The point is also made, and should be carefully noted, that it is during the first year of syphilis that the disease is most likely to be conveyed to the child.

In discussing the prophylaxis of syphilis the writers, while urging a more general dissemination of knowledge in regard to the disease, strongly insist that those affected with syphilis should be warned against

the danger of infection. At the same time, a strong plea is made for licensing prostitution and for legal supervision of the prostitute, and consequent protection for the general public.

The statements of the authors concerning that much-discussed question as to the administration of mercury prior to the appearance of secondary manifestations, are very clear, and, coming from such authorities, must of necessity carry considerable weight. The rule here laid down is—never to administer mercury before the appearance of secondary symptoms, except where one is sure that the sore is a chancre, which is not often the case, and where the diagnosis is still further confirmed by confrontation. One cannot help but be impressed with the fact, in going over the treatment of syphilis as outlined in this treatise, that it is the constant intention of the writers to point out and insist that not only the disease, but the patient also, must be treated. This is a most valuable point, and one so often overlooked by the general practitioner of medicine, who is apt to see in a given case of syphilis nothing more than an indication for the internal administration of either mercury or iodide of potassium. Indispensable as these drugs are, it should always be borne in mind that in many cases very much more is needed.

Chapter XVI., on the examination of the urine, is an extremely valuable contribution to the work, and is a decided novelty in books on genito-urinary diseases. But that such a chapter should be considered necessary in a work of this character is still further evidence of the fact that there can no longer be any hard-and-fast line drawn between the medical man and the genito-urinary surgeon.

As would naturally be expected, the chapter on enlarged prostate and its treatment is a most instructive and important feature of the work, giving in an admirable manner all the methods of treating this troublesome condition. The operation of castration, first devised by Dr. White, for the relief of enlarged prostate, is discussed at some length and the indications for the operation very fully detailed.

In conclusion, it only remains for us to extend our congratulations to the authors upon the appearance of their book, which is surely destined to occupy a leading position as an authority in genito-urinary surgery.

H. M. C.

THE PRINCIPLES OF THEORETICAL CHEMISTRY, WITH SPECIAL REFERENCE TO THE CONSTITUTION OF CHEMICAL COMPOUNDS. By IRA REMSEN. Fifth edition, thoroughly revised. 12mo. pp. x. 320. Philadelphia and New York: Lea Brothers & Co.

A WORK, especially a text-book in chemistry, that has gone through five editions in a comparatively short time, cannot hope nor fear much from the reviewer. The present edition of Professor Remsen's well-known work presents but little difference from its immediate predecessor. There have been but few pages added, those devoted to stereochemistry. The greater portion of the book is beyond the necessity of criticism or review; it is universally recognized as a conservative and concise exposition of the prevailing theories in regard to the structure of chemical compounds. In the preface we are told that the author

has resisted the temptation to bring the book more into keeping with the modern trend in chemistry, especially physical chemistry. This statement is repeated frankly from the fourth edition; we trust that it will not be repeated in the sixth. It is to be sincerely hoped that the learned author will give us in the next edition a good exposition of the views which have lately been so actively exploited, and which are mostly presented in forms but little available for the average teacher. We would suggest, also, the introduction of a complete table of the elements, with atomic weights as determined by the latest researches.

The typographical execution of the book is good. The index is rather scanty.

H. L.

PATHOLOGICAL TECHNIQUE: A PRACTICAL MANUAL FOR THE PATHOLOGICAL LABORATORY. By FRANK BURR MALLORY, A.M., M.D., Assistant Professor of Pathology, Harvard University Medical School; Assistant Pathologist to the Boston City Hospital; Pathologist to the Children's Hospital and to the Carney Hospital; and JAMES HOMER WRIGHT, A.M., M.D., Director of the Laboratory of the Massachusetts General Hospital; Instructor in Pathology, Harvard University Medical School. With 105 illustrations. 8vo. pp. 397. Philadelphia: W. B. Saunders, 1897.

THE book which is the subject of this review treats of matters of great and growing importance, with which every physician, though he be not a pathologist or a bacteriologist, should be acquainted.

Pathological technique has developed in recent years with a rapidity truly wonderful, and almost every step of its progress has been followed by some great discovery.

Perhaps the importance of technical knowledge is best exemplified in the history of the development of bacteriology.

The theory of a *contagium vivum* may have had its origin contemporaneously with that of spontaneous generation, though the first mention we can find of it is by M. Terentius Varro, a contemporary of Cicero. It, however, for ages remained but a crude theory, and was not fully developed until the latter part of the present century.

The important advances in our methods of research, which culminated in firmly establishing bacteriology upon a scientific basis, may be said to have begun in 1854, when Schröder and Van Dusch demonstrated the utility of cotton-wool. Then followed the notable experiments upon the sterilization of fluids, conducted principally by Koch and Pasteur. In 1877 Weigert introduced aniline dyes for the staining of bacteria, and the success of this innovation greatly stimulated the study of micro-organisms. In 1881 Koch brought forward the solid culture media and the plate method, a contribution to our resources fraught with the greatest good to the young science then struggling for recognition. These several discoveries, together with the improvements of the compound microscope, have made possible the many brilliant achievements of the workers in the field of bacteriology.

Technique has been as potent a factor in the development of pathology and histology as it has in bacteriology, though in the former its influences are less evident than in the latter.

As pathologists and bacteriologists have always appreciated the importance of technique, they have devoted much time and thought to its

development, so that there is now accumulated a vast amount of material. To select from such an abundance only what is most useful and what essential is a difficult task, demanding, as it does of those who attempt it, great practical knowledge, large experience, good judgment, and nice discrimination. That such qualifications are possessed by Drs. Mallory and Wright is amply shown in the little volume entitled *Pathological Technique* which they have just given to the medical profession.

The authors have divided their subject into three parts, as follows: Part I., Post-mortem Examinations; Part II., Bacteriological Examinations; Part III., Histological Methods.

Part I. does not show the careful preparation so evident in Parts II. and III.; nevertheless, it is very good, and both the practising physician and the beginner in pathological research will find in it much information of great value.

The method recommended for conducting an autopsy is a good one, and we have no hesitation in advising its adoption where none other has been acquired.

The vital point in conducting an autopsy is method. It matters not how adept the operator may be with the knife, or how thorough his knowledge of pathology, the whole object of the examination may be defeated unless he pursue his investigations in a methodical manner.

Under the headings "General Rules" and "Suggestions to Beginners" are grouped a number of practical hints with which every physician should be conversant.

The remarks upon private autopsies are quite pertinent; and were the precautions advised by the authors always observed the objections to autopsies so generally held by the laity would, to a great extent, be removed.

Positive directions are given for preventing the mutilation of the corpse and the defilement of its coverings, and for preserving the cleanliness of the room wherein the autopsy is held.

In Part II. the presentation of "Bacteriological Examinations" is ably accomplished. It is condensed within a very limited space, and is entirely free from ambiguity, for we may carefully con over the work, page by page, from the beginning to the end of the section, without meeting a passage in which the idea to be conveyed is involved in doubt.

In the first few pages a brief description is given of some of the necessary apparatus for pursuing bacteriological studies, and the chief value of this section is its brevity.

Full instructions are given for the preparation of culture media, the staining and mounting of cover-glass spreads of bacteria, the study of bacteria in tissues and in cultures, the securing of pure cultures, the inoculation of animals, and, in fact, all the essential features of bacteriological technique.

In Bacteriological Diagnosis the more important pathogenic bacteria are described and the peculiar characteristics of each organism noted.

In those instances where special culture-media are required for the propagation of certain micro-organisms, explicit directions are given for the making of those culture media, so that the entire section is replete with the most useful information.

The feature of Part II., sure to be appreciated by every progressive physician, is that devoted to the discussion of clinical bacteriology.

Here one may seek, and not in vain, for the most recent developments in applied bacteriology. Those methods by which it is determined whether or not the causal factor of a disease is a micro-organism receive such careful treatment that many physicians will be enabled to supplement their physical examinations of cases, in which the diagnosis is obscure, by bacteriological investigations; or, if they cannot themselves carry out such investigations, they will find full instructions for collecting the material to be forwarded to a bacteriologist.

The high standard set in Part II. is fully maintained in Part III.

All the various details essential to a thorough examination of specimens are given under appropriate headings.

We deem it unnecessary to particularize the many good features of Part III.; there is one, however, worthy of note, and that is the section treating of the methods employed in the examination of animal parasites.

The description of the examination of the urine is very meagre. Had the authors treated this subject with the consideration its importance warrants, we think that the value of the book would have been greatly enhanced.

Throughout the book there is such an excellent arrangement and classification of the subject, that frequent references to the index are unnecessary. This is, indeed, a very pleasing feature, and we would that all authors were, in such particulars, as painstaking as Drs. Mallory and Wright.

The publishers, too, have ably acquitted themselves.

The book has a neat and substantial binding, the paper is of an excellent quality, the type clear and distinct, and the illustrations numerous and well executed.

In closing this review, the book is one that may be heartily recommended to the pathologist, bacteriologist, and practising physician, and we trust that it will meet with the favor it deserves. D. B.

AMBROISE PARÉ AND HIS TIMES, 1510-1590. By STEPHEN PAGET. 16mo. pp. 308. New York: G. P. Putnam's Sons, 1897.

MR. STEPHEN PAGET has come before the profession recently with two biographies of the Heroes of Medicine: The life of John Hunter and the volume under review. The profession cannot be too familiar with its heroes, among whom in the very first rank as a surgeon is Ambroise Paré. The life before us is very well told in an excellently printed and beautifully illustrated volume. Paré is allowed to tell a large part of the story himself, and it makes a most entertaining volume. The arrangement of the volume does not seem to us as happy as it might have been if the "Journeys in Divers Places" and the "Notes" had been placed toward the end, instead of being interpolated between his early life and his life in Paris, though there is some chronological justification for it.

His account of some of the battles he witnessed and the after-history of the prisoners throws a curious light on the manners of the times. For example, when M. de Vaudeville took M. de Bauge, one of the nobility, a prisoner, M. de Vaudeville, to whom he was unknown, recognized him as a gentleman of good family; he made him pull off his stockings,

and, "seeing his clean legs and feet, and his fine white stockings, knew he was one to pay a good ransom." He bought him from the soldiers for thirty crowns. Later, the Queen of Hungary and the Duc de Savoie sent word to M. de Vaudeville that "this mouthful was too big for him [how near to our modern slang!], and he must send his prisoner to them, which he did, as he had other prisoners enough without him." The ransom paid was forty thousand crowns, without other expenses. Fighting seemed then to be personal, and the taking of prisoners very profitable from a pecuniary point of view—very different from our modern methods of warfare. His account of the plague is both interesting and instructive. The absolute want of sanitary arrangements and the atrocities perpetrated during the plague are vividly portrayed.

We can commend the book, to any one who is not familiar with Ambroise Paré's life, as one that will both instruct and interest him.

W. W. K.

TRAUMATIC INJURIES OF THE BRAIN AND ITS MEMBRANES; WITH A SPECIAL STUDY OF PISTOL-SHOT WOUNDS OF THE HEAD IN THEIR MEDICO-LEGAL AND SURGICAL RELATIONS. By CHARLES PHELPS, M. D., Surgeon to Bellevue and St. Vincent's Hospitals. 8vo. pp. 582, with forty-nine illustrations. New York: D. Appleton & Co., 1897.

This remarkable work appears certain to rank among the first upon the subject of traumatism of the cranial contents, if, indeed, it does not occupy the position of pre-eminence. It is a fit companion volume to Macewen's far-famed *History of the Pyogenic Inflammations of the Brain and Spinal Cord*, and, with it, forms a splendid summary of modern knowledge of cerebral, infective, and traumatic disorders. As stated in the preface, it is designed to be a concise and systematic exposition of the injuries which the brain suffers from external violence, a division of brain surgery which has the greatest practical importance and has received the least careful attention. It has been based essentially, if not entirely, upon an observation of five hundred consecutive cases of recent occurrence. The picture which they represent is complete in every respect save secondary pyogenic infection of the brain substance, but even this deficiency has been supplied by a condensation of the views of Macewen as expressed in the above-mentioned volume. These cases are so large in number, varied in character, and complete in detail as to have afforded the distinguished author ample materials from which to build up this comprehensive and satisfactory treatise.

The volume is divided into three parts. Part I. is concerned with general traumatic lesions, embracing general considerations of cranial fractures, as well as their pathology, symptomatology, diagnosis, prognosis, and principles of treatment. The intracranial traumatic lesions are classified as hemorrhages, thromboses of sinuses, contusions, lacerations and their sequelæ, as meningeal and parenchymatous inflammations, usually septic, and atrophy. Hemorrhage is studied under the headings of epidural, pial, and cortical. Concussion of the brain is eliminated as a relic of the past without scientific basis, and for its phenomena the lesions of contusion and laceration are made responsible. All symptoms are held to result from demonstrable organic changes. By the elimination of the terms "encephalitis" and "compression," the study of symptoms has also been much clarified. "As each form of intracra-

nial injury is attended by characteristic outward manifestations, and as no evidence exists that these occur independently of anatomical change, symptoms should be grouped under the name of their pathogenic lesion." The chapters on symptomatology are exceedingly valuable, and contain many new and surprising facts. The thoroughness, exactness, diligence, and judicial mind of the author are here in especial evidence. The studies of hemilateral pulse and temperature variations, unreliability of pupil variations, and the seemingly proved relation between emotional and intellectual derangements and lesion of the left frontal lobe are all of great importance. He doubts if ataxia is ever occasioned by cerebellar laceration, but considers that clonic contraction or tetanic spasm is symptomatic of cerebral laceration, and, to some extent, indicative of the region involved. "The comparative frequency of some form of aphasia in recovering cases is a probable result of general rather than local lesion." Early and perfect restoration of such cases would point to circulatory rather than structural disturbance. Loss of control of bladder and rectum is almost always due to laceration of cerebral parenchyma. These chapters fairly bristle with practical hints and deductions. Those devoted to treatment are admirable and properly conservative summaries of modern knowledge without any especial additions by the writer.

Part II. exhaustively treats of the medico-legal and surgical relations of pistol-shot wounds of the head. The total number of experimental pistol wounds of the cranium made for this study was in excess of a thousand! The chapter on surgical relations is based on one hundred and thirty-six clinical cases, in addition to the cadaver wounds. Accompanying the chapters on medico-legal relations are forty-one full-page photographic reproductions.

Part III. contains 189 pages devoted to the condensed histories of 300 selected cases of intracranial traumatism. Of these, 235 were verified by necropsy. In all they afford a perfect mine of facts concerning almost every possible type and variety of brain and cranial injury.

The book is well made and the illustrations are excellent, but the absence of an index is a very serious defect. Without an index, much of the extraordinary information contained in the volume will remain in oblivion.

T. S. K. M.

TRANSACTIONS AMERICAN SURGICAL ASSOCIATION. Vol. XIV., 1896.
Philadelphia: Wm. J. Dornan.

This volume contains a number of important articles which were read and discussed at the meeting of the Association, May, 1896.

The admirable address of the President, Dr. Tiffany, on "Intracranial Operations for the Cure of Facial Neuralgia," is instructive. He records 108 cases of facial neuralgia that have been operated upon by the intracranial method, with a mortality of 22 per cent.; shock and sepsis are the chief causes of death, and he claims that the large mortality will be greatly diminished by the adoption of an improved technique, with increased experience.

The intracranial operation is recommended when more than one branch is affected, when the pain is not the expression of a constitutional disease, and when other measures have failed to relieve.

Dr. Senn's article on "Tuberculosis of the Male Genital Organs" is very important, because the literature on tubercular affections of these organs is scanty as compared with the literature on tubercular affections of the lungs, pleura, peritoneum, lymphatic glands, bones, joints, meninges, and the skin.

Dr. Fowler's article on the "Surgery of Intrathoracic Tuberculosis" is interesting and instructive. He reviews the subject from the Hippocratic era of the science and art of medicine up to the present date. Dr. Willard, in speaking of "Tubercular Infection of Superficial Glands," says they are a constant menace to the system, and should be removed. During thirty years' experience he is satisfied that the cases not subjected to operation for this disorder have become tubercular or have died in far larger proportion than the same number from whom the glands have been removed.

The general subject of the "Surgical Treatment of Tuberculosis" was ably discussed.

Dr. Cabot's paper on "Castration for Enlarged Prostate" shows the mortality in 203 cases of 19.4 per cent. So high a death-rate for so slight an operation is surprising and requires an explanation.

One of the most important articles in this volume of the *Transactions* is the one on the "Treatment of Traumatic Lesions of the Kidney, with Tables of 155 Cases," by Dr. W. W. Keen. One of the leading features of the article is the attention given to partial nephrectomy. He insists on making an exploratory incision when symptoms are threatening, especially if there be marked evidence of hemorrhage. The tables show that secondary nephrectomy is nearly twice as fatal as primary nephrectomy.

Dr. Roswell Park, on "Surgical Infection," contends that, since the inauguration of the so-called antiseptic era, and in our enthusiasm for combating infection from without, we have lost sight of a most important truth, which we cannot afford to disregard, namely, that in this enthusiasm for combating infection from without we have almost neglected, first, the recognition, and, second, the successful prevention of infection from within. Certain it is that in the majority of instances the latter (*i. e.*, infection from within) is much more liable to ensue, and particularly in a class of cases where one is tempted, for one reason or another, to be less careful than he ought to be.

If one reads Dudley P. Allen's paper on the "Effect of Anæsthesia upon Temperature and Blood-pressure," he will find, by the observations made upon thirty-five dogs and eighty patients, that it will not do to disregard the loss of heat during prolonged operations.

Dr. Joseph Ransohoff reports an interesting case of fibrosarcoma, with bone-formation. The tumor weighed eighteen pounds, and was situated on the postero-internal aspect of the right thigh. The tumor was successfully removed and there was no recurrence one year after the operation.

Dr. Mixer presents two brief articles: the first on "Double Dislocation of the Jaw of Three Months' Duration." The patient had had puerperal convulsions, and since the convulsions she had been unable to close the jaw. Dr. Mixer describes an apparatus which he devised for reducing such dislocations, which acted admirably. The second article is on the "Operative Treatment of Trifacial Neuralgia." He reports three cases in which he has removed the Gasserian ganglion by the Krause-Hartley method.

Dr. Elliot reports a successful laparotomy and Kraske operation for absence of rectum in an infant two days old. The author believes his case is the first where a laparotomy was combined with a Kraske operation for the correction of imperforate rectum.

In this volume of the *Transactions* Dr. McFadden Gaston presents an article on an "Improved Method of Exploring the Thorax." His method of making a trap-door opening in the chest-wall is an advance upon methods hitherto adopted.

Dr. Rudolph Matas's article on "The Surgical Peculiarities of the Negro" is a book in itself. It shows the result of many laborious hours, and any one who is interested in the comparative study of the negro race in regard to surgical peculiarities will find it to his advantage to read this interesting article.

Dr. John B. Roberts reports a "Clinical, Pathological, and Experimental Study of Fracture of the Lower End of the Radius, with Displacement of the Carpal Fragment toward the Flexor or Anterior Surface of the Wrist." This article contains a number of photographs, and a skiagraph which clearly shows the deformity which followed an injury to the right wrist.

Dr. De Forest Willard's Röntgen-ray skiagraphs of tubercular knees and knock-knees are very interesting. The skiagraphs of the tubercular knees demonstrate that the use of the Röntgen rays for the purpose of diagnosis and treatment is of the greatest practical value.

This volume ends with a lengthy and interesting report of Dr. S. H. Weeks, who was the delegate to the British Medical Association. This book can be cordially commended to students of surgery, as it contains many new and sound surgical ideas advanced by our leading surgeons.

G. W. S.

PICTORIAL ATLAS OF SKIN DISEASES AND SYPHILITIC AFFECTIONS, in photo-lithochromes from models in the Museum of the Saint Louis Hospital, Paris. By BESNIER, FOURNIER, TENNESON, HALLOPEAU, DU CASTEL FEULARD, and JACQUET; edited by J. J. PRINGLE. Parts X. and XI. London (Rebman Publishing Company) and Philadelphia (W. B. Saunders), 1897.

NOTICE has been taken in the *JOURNAL* on several occasions of this valuable *Atlas*. The parts before us are entirely up to the high standard of the preceding parts, and comprise "Polymorphous Syphilodermata," by A. Fournier; "Paget's Disease of the Nipple," by J. Darier (an excellent article as well as a fine picture); "Trophic Ulcers of the Hand and Forearm," by L. Jacquet; "Syphilitic Chancre of the Face and Breast," by A. Fournier; "Hydroic Erythema of the Hands and Lips," by Du Castel; "Pigmentary Syphiloderm" (of the side of the neck, and darker than usual), by G. Baudouin; "Molluscum Contagiosum" (of the vulva and thighs), by G. Baudouin; "Vascular Nævus Verrucosus of the Leg" (multiple, and irregularly distributed), by E. Gaucher; and "Pediculosis Vestimentorum with Pigmentation," by L. Jacquet. The list of diseases enumerated shows the scope of the *Atlas*. Some are rare or very rare, while others are common; all are equally well reproduced. The text in some cases is brief; in others lengthy and valuable as a contribution to the subject, as in the article by Darier referred to.

L. A. D.

PROGRESS
OF
MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,

PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

Peronin.—DR. M. EBERSON states that this drug occurs as a dirty-white, bulky, fine powder, without odor, but of bitter taste, with difficulty soluble in cold, but readily in hot water. It is insoluble in acids, concentrated alcohol, and chloroform. Chemically it is benzyl-morphine chloride ($C_{34}H_{25}NO_3.HCl$). Sixteen instances of its use are reported: acute bronchial catarrh, five; chronic bronchial catarrh, three; pulmonary tuberculosis, five; and whooping-cough, three. In general, the results as a cough sedative were favorable. For adults the dose is from one-sixth to one-third of a grain four times daily, in syrup, as a powder, or in tablets or cachets. Its bitter taste should be concealed, and it should be prevented from giving rise to burning sensations in the throat. Its use did not affect the appetite, circulation, or general condition. It diminishes the amount of expectoration, but without hindering its expulsion. On the whole, it appears to be a valuable substitute for morphine. It quickly cures acute bronchitis. It improves the cough-irritation, expectoration, and sleep in chronic bronchitis and pulmonary tuberculosis. It does not injure in any way the digestion. It is not poisonous, even after long-continued use. The only exception to this was found in a two-year old child, who showed drowsiness. Most excellent results were obtained in one instance of hysterical cough, and in three of whooping-cough.—*Therapeutische Monatshefte*, 1897, Heft xi. S. 591.

[For all that this report is favorable, the essential fact at issue is not discussed: how much and in what way is this preferable to other salts of morphine?—R. W. W.]

Creosote Carbonate.—DRS. PAUL JACOB and HANS NORDT present the results of their use of this drug, 103 cases of pulmonary tuberculosis having been under observation. They state that earlier creosote preparations were objectionable from their disturbing the gastro-intestinal tract, diminishing

the appetite and being detrimental to the general condition, while the preparation in question is free from these disadvantages. The dosage began with five drops thrice daily, and gradually increased to twenty-five. The patients received a generous diet. Weighing at regular intervals was insisted upon. Twenty-eight of these histories are given in detail. Of these eleven showed good, sixteen fair, and one no result. For the remainder, some showed marked, and others moderate improvement, in spite of the fact that in some one-half, in others the whole of the treatment was carried out during the fall and winter months, so that climatic influences and out-door exercise as aids to treatment could not be employed. While under treatment colds were infrequently observed, and thus a common cause of failure to improve is measurably removed. In not a single instance was the appetite unfavorably influenced. In five a loss of appetite, brought about by previous treatment, disappeared. In general there was a gain in weight. The cough and expectoration steadily improved, and in most the physical signs were either the same or indicating less involvement of the lung. Whether we believe or not in the specific action of this remedy, it is apparent that it favorably influences the fever and night-sweats, and that it is superior to other preparations in that it does not interfere with but rather favors the nutrition of the patient.—*Charité-Annalen* (Berlin), 1897, S. 159.

[From a more extended experience reported three years ago, we reached substantially the same conclusions.—R. W. W.]

Treatment of the Coryza of Children.—DR. H. NAEGELI-AKERBLOM for the past six years has employed the following method for children, even for nurslings. A 2 per cent. solution of cocaine in equal parts of distilled water and glycerin is made. One drop of this is instilled into each nostril three or four times daily with a medicine-dropper. The immediate result is the opening of the nasal passages, so that the child can readily breathe through the nose and rhinoscopy can be carried out. This method is not dangerous, and the effect can be readily estimated by an investigation of the eyes (pupillary dilatation).—*Therapeutische Wochenschrift*, 1897, No. 57, S. 1311.

Treatment of Epilepsy by the Method of Bechtereid.—DOTT. DE CESARE makes use of the following: Adonis vernalis, 15 grains; infused in water, 12 drachms; to this is added potassium bromide, 75 grains; codeine, $\frac{3}{4}$ grain; syrup, 4 drachms; and water, 2½ ounces. One-half of this is taken in the morning, the rest at bedtime. Good results have been obtained upon eight patients during six weeks, in that convulsions ceased in four and the remainder noticed only vertigo.—*Riforma Medica*, 1897, No. 188, p. 447.

The Treatment of Tetanus by Antitetanic Serum.—DR. ED. BOINET reports a single successful instance where ten injections were used. In this instance the germs had preserved their virulence for a long time, even in the dried earth which may cover merchandise coming from warm countries. The bacilli gained entrance through some scratches, the remains of which were then evident, and probably by the respiratory tract as well. Treatment was commenced eight days after the onset of the disease. This treatment is

likely to be more successful when used as a preventive, when the period of incubation is longer and when the progress of the disease is slower. Also the more slowly the tetanus toxin poisons the nervous elements the longer time will the serum have to act, especially if the prompt ablation of the site of infection prevents the absorption and elaboration of the poison of tetanus.—*Bulletin Général de Thérapeutique*, 1897, 10e liv., p. 433.

The Untoward Action of Lactophenin.—DR. ARMIN HUBER reports an instance of a fifty-year old woman who had suffered for many years from hemorrhagic nephritis and commencing cirrhosis. During the past year she had emaciated and had suffered from headaches. During the month just past she had taken seven grains of the drug without the slightest inconvenience. On one day she took four grains in the morning and early in the afternoon seven more. Later she noted a prickly-heat in the head, swelling of the face, and in the evening she experienced a chill, which was followed by fever and a severe headache. The next morning there were erythematous patches, the size of a silver dollar, upon the face, severe swelling of the upper lip, and upon its inner surface vesicles the size of a bean, and bloody ulcerations of the same size. The tongue was enlarged, so that its movements were difficult, and upon its right inferior surface an ulceration which was coated with fibrin. There was severe *fetor ex ore*. The vagina burned and itched; on the right *labium minus* was found a small ulcer accompanied by oedematous swelling, and leucorrhœa. This attack produced no change in the urine, neither increasing the blood nor albumin; the quantity and specific and the ulcerations healed without scar. The itching gradually diminished, gravity were not altered. After eight days convalescence was established, so severe symptoms from lactophenin are rare. Macular exanthemata and icterus have, however, been recorded. The practising physician should keep in mind that "*nil prodest quod non leadere possit idems*" (Ovid).—*Correspondenzblatt für Schweizer Aerzte*, 1897, No. 24, S. 737.

Paraldehyde for Hypodermatic Use.—DR. G. MAURANGE administers from seven to thirty grains of this drug as an hypnotic in certain neuroses (epilepsy, hysteria), in the insomnia of patients suffering from cardiac disease, and in angina pectoris. It is also an antagonist to strychnine and has given good results in tetanus and eclampsia. It formerly gave rise to abscesses (Dujardin and Beaumetz), and possibly the drug was impure. This obstacle has been removed, and pure crystalline paraldehyde can be obtained. If oil is used instead of water as a solvent there are no difficulties in its use. The formula employed is: Paraldehyde, 75 to 150 grains; essence of peppermint, 2 drops; sterilized olive oil, 5 drachms. Of this from one-fourth to one and one-fourth drachms can be given. The remedy is rapidly eliminated by the breath, giving it an unpleasant odor (similar to that of drunkards). The respiration is slowed, the temperature falls, the higher nerve-centres have their congestion removed, and sleep rapidly supervenes, resembling that produced by chloral.—*Les Nouveaux Remèdes*, 1897, No. 22, p. 700.

[The objection to this treatment is not so much to the manner as to the drug. An hypnotic which can be administered hypodermatically is desirable, and we have it in pelltine.—R. W. W.]

The Influence of Digitalis on the Heart-muscle when the Drug is Administered for a Long Period of Time.—DR. H. A. HARE, from observations made upon five pigs to which digitalis was administered, and upon five controls, found on microscopic examination that the ventricular wall was much thicker in the digitalis hearts than in the hearts of those animals which had received no digitalis. In addition, the muscle cut with more resistance, and seemed uniformly firmer. The increase in the left ventricular wall was far greater than in the right. Microscopically it was found that the entire increase was probably due to an increase in the size of the muscular fibres rather than to an increase in their number. In this connection it is of interest to consider for a moment the theory that the pneumogastric nerves, for which digitalis has an especial affinity, are the trophic nerves of the heart; and if this be so it is not hard to understand why digitalis increases the size of the heart-muscle. Whether this trophic influence be exercised or not, it is well known that the effects of this drug upon the heart are such that its muscle-fibre obtains a greater supply of blood with each cycle by reason of the increased force of the systole, the heightened arterial pressure, and the prolonged and increased systole. This research would, therefore, seem to prove that the prolonged use of this drug is capable of producing cardiac hypertrophy in the normal heart, and if this is the case it is fair to assume that when the drug is given to a man suffering with valvular disease, with deficient compensation, it must aid materially in inducing compensatory hypertrophy in addition to any immediate stimulant action which it may exercise on the circulatory apparatus.—*Therapeutic Gazette*, 1897, No. 12, p. 800.

Methylene-blue in Diseases of the Urinary Passages.—DR. G. RICHARD D'AULNAY concludes a paper, in which he presents the results in diseases of the kidneys, bladder, and urethra, with a brief *résumé*: (1) It is an excellent microbicide, (2) it coagulates pus, (3) it prevents fermentation, and (4) it is an excellent analgesic when given internally, and these properties determine its indications in various affections of the urinary system.—*Bulletin Général de Thérapeutique*, 1897, 8e liv., p. 352.

Chelidonium.—DR. HUGO GUTH reports the results of the use of this drug, which is an alkaloid obtained from the *chelidonium majus* and has been offered as a substitute for morphine to relieve pain. Six patients suffering from carcinoma of the stomach, one each from *tabes dorsalis*, *osteomalacia*, and *arthritis fungosa*, received varying doses of the sulphate—from one to six grains daily—without any result.—*Therapeutische Monatshefte*, 1897, Heft 10, S. 515.

Beginning Pulmonary Tuberculosis Treated with Subcutaneous Injections of Koch's Tuberculin.—DR. ELBRIDGE G. CUTLER has treated two patients. The solutions were freshly prepared for each injection according to the printed directions. The injection was invariably given between or below the scapulae. Each injection was given with an ordinary subcutaneous syringe. This necessitated filling the barrel of the syringe three times for each injection on an average, and the introduction of the needle into a new place each time. There was no abscess produced in the eighty or more

punctures which were made during the treatment of the cases. The only complaint was of a slight soreness in one case in the neighborhood of the injections on about the sixth day of treatment. The injections were also made in three other cases, but as these cases were not suitable for the treatment, from too advanced a stage of the tuberculous process, they have not been included in this report. No constitutional symptoms were observed after the injections in these two cases, nor did the temperature more than once rise as much as one degree Fahrenheit above its usual course. As a rule, the cough and local signs progressively diminished, the amount of the expectoration lessened, and the patient felt progressively better in all the cases in which he has used the remedy, though in the unfit cases (too advanced a stage of disease) emaciation and an extension of the disease kept steadily on.—*Boston Medical and Surgical Journal*, 1897, vol. cxxxvii., p. 571.

DR. J. S. DAURIAC reports his results from sixteen patients observed. With these and others he has administered about two thousand injections; after none (one instance excepted) was there an elevation of temperature. But rarely were local reactions noted at the point of injection, and these were probably due to faulty material or technique. Sometimes after large doses administered in the evening there followed insomnia, nervous agitation, and malaise, lasting for several hours. The fever rapidly diminishes and the sweating disappears, often permanently. The appetite returns, and with it the felling of *bien-être*, which impresses the patient favorably. With patients who expectorate freely there follows a veritable downpour of sputa in the early part of treatment. Later the expectoration clears up and becomes fluid. Hemoptysis is favorably influenced and diarrhoea often disappears after some days of treatment. That the results are due to suggestion is denied, for this is insufficient to explain the disappearance of the lesions and of the bacilli, and to account for the increase in weight.—*Le Progrès Medical*, 1897, No. 49, p. 425; No. 50, p. 441.

[It is altogether too early to report definitely as to the value of this remedy. The observers seem to follow the directions laid down by Koch, and their enthusiasm is tempered by the recollections of previous disastrous failures.—R. W. W.]

The Abortive Treatment of Influenza with Calomel.—DR. G. FREUDENTHAL reports thirty-two instances of the use of this method. The duration of the disease varied from two to six days. For adult males one and one-half grains were given twice; for females, three doses of one grain; for children, without regard to sex, as many sixths of a grain as the child was years old. Within from six to ten hours after the commencement of the treatment the high fever lessened, the head- and backaches were relieved, and the coughing and sneezing were lessened. The change of the drug into sublimate in the organism is believed to be the explanation of the results.—*Therapeutische Monatshefte*, 1897, Heft 10, S. 524.

Kryofin for Influenza.—DR. BRESLER reports sixteen instances of the use of this drug in doses of from seven to fifteen grains, administered in wafers or as a dry powder. The drug is certainly antipyretic, and as well relieves the subjective symptoms without producing any untoward effect, save

in one instance. This was a nervous, weak, spare woman, who, from fifteen grains, developed a cyanosis which lasted a few hours.—*Therapeutische Monatshefte*, 1897, Heft 10, S. 551.

[A limited experience with this drug seems to indicate that, although slow in action, it is safe.—R. W. W.]

The Hot-air Treatment.—DRS. ELLWOOD R. KIRBY and JOSEPH M. O'MALLEY report upon this method, which has been dignified by the title of *thermotherapeia*. They believe that it will find its greatest use in those cases of acute origin, such as sprains, tendinous inflammations, acute muscular strains, acute rheumatic conditions, and as an after-treatment of fractures and dislocations, to promote and aid the elimination of effete substances through the skin, by sweating, and through the lymph-channels, increasing the blood-supply and thereby the nutrition of the part. It is absolutely contraindicated in cases of rheumatoid arthritis, and of but little value in chronic rheumatic affections.—*Therapeutic Gazette*, 1897, No. 11, p. 721.

[We are inclined to indorse these conclusions as correct. The method is not new, and its limitations are well defined.—R. W. W.]

Theobromine in the Treatment of the Asystole of Old Age.—M. E. BARONAKI proceeds as follows: The patient being placed upon an absolute milk diet, he receives thirty drops of the tincture of digitalis each day for four consecutive days. At the end of this time the digitalis is omitted, and he takes seven and one-half grains of theobromine in water every two hours until forty-five grains are taken each day. Diuresis is established within twenty-four hours, the urine often reaching from four to six quarts, and with this the oedema and uræmic symptoms disappear. As soon as this is obtained the drug is stopped, else nausea, vomiting, vertigo, and symptoms of excitement will appear. Next potassium iodide is administered. Should the oedema reappear, the same course is to be pursued. This plan is recommended as a safe one for the asystole of old age.—*Bulletin Général de Therapeutique*, 1897, 8e liv., p. 380.

The Treatment of Neurasthenia.—DR. WIEDERHOLD believes that the cause of this symptom-complex lies in deficient metabolism in the nervous system, slow blood changes and venous stasis, brought about through insufficient respiration and weak heart-function. As a result, there is an oxygen hunger of the tissues of the nervous system, which should be combated by direct oxygen-inhalation. Especially in pale, obese neurasthenics have good results been obtained. The mouth is disinfected so that *factor ex ore* and coated tongue disappear, and the senses of taste and smell improve.—*Therapeutische Monatshefte*, 1897, Heft 10, S. 558.

Diuretics.—DR. JAMES BARR presents an interesting paper, reaching the following conclusions, treating briefly of some of those diseases in which we find it necessary to increase renal activity. The flushing process, so largely adopted at many health resorts, is mainly based on the idea of washing out waste products, ptomaines, and other poisonous substances. The waters from natural springs have no specific properties which do not equally exist

in similar artificial products, and many of the so-called "cures" carried out at mineral springs are nothing more than a gold-extracting process. It is unfortunately too frequently a fact that effete materials retained in the system require to be eliminated, but this can be equally well effected in all countries by an abundant supply of pure mild alkaline water and whey. The fact that so much flushing is so frequently required is evidence that the individual has not been leading a healthy physiological life. Those who imagine that they can preserve their health and longevity by free living, little exercise, and six weeks at a health-resort each year, will in time discover their mistake. It is much more rational to so regulate the diet, exercise, and all the bodily functions that no more work will be required of any organ than it can easily perform. In the treatment of granular kidney the defect is in the power of eliminating solids, and the flushing process carried out by nature is of comparatively little use. The best treatment is to cut off all nitrogenous foods, all alcohol, to live on a purely vegetarian diet, to drink whey and mild alkaline waters, and to regulate the intestinal secretions with an occasional dose of calomel or other mild aperient. Ammonium benzoate will be found an excellent eliminator, especially when there are uræmic symptoms. Other elements in the treatment are warm clothing, moderate exercise, and, if possible, a warm, dry climate. In the venous congestion from cardiac failure we must raise the arterial pressure with cardio-vascular tonics, the best of which are digitalis, caffeine, squill, strophanthus, convallaria, ammonia, and senega. The drugs are often advantageously combined with agents which dilate the renal arterioles, such as sweet spirit of nitre, small doses of nitroglycerin, or sodium nitrite, as thus a larger volume of blood is sent through the kidneys, and the arterial tension is prevented from rising so high as to overpower the heart. In aortic disease, both obstructive and regurgitant, the arterial tension is usually well maintained until the near end, and so we get little or no dropsy unless there be marked cardiac failure, and then our treatment is usually very palliative—rest, mild diet, limited ingestion of fluid, gentle laxatives, and such tonics as strophanthus, caffeine, strychnine, digitalis, and squill. In mitral regurgitation the arterial tension is usually low, arterioles and capillaries large and full, and venous pressure high. Consequently we frequently get much œdema of lower extremities. The treatment is rest, limited supply of fluid (though this is not so imperative as in cases of advanced mitral stenosis), mild laxatives, and digitalis is the drug *par excellence*. In mitral stenosis the arterial tree is small and tension high, so we do not get dropsy until a very late stage. Then the treatment is rest, a light dry diet, calomel or other laxatives, strophanthus, or small doses of digitalis usually combined with strychnine and minute doses of nitroglycerin. Ammonia and squill are often very useful for the accompanying lung mischief. Pulmonic incompetence is a common sequence in cases of mitral stenosis, and the indications for treatment are to lower pulmonic tension and general venous congestion by free purgation and lessening the supply of fluid. A relatively large quantity of blood should be kept in the arterial side by dilating the arterioles with nitroglycerin. In tricuspid regurgitation the lines of treatment are much the same as those of the mitral lesions, with which it is usually associated. When tricuspid stenosis occurs it is accompanied by mitral stenosis in a more advanced stage. The combined lesions

do not render the prognosis more grave, but the tricuspid narrowing gives rise to certain distinctive features of its own, such as high pressure in the veins of the neck, with auricular and ventricular pulsation; the obstruction to the return current from the vena azygos and cardiac veins not infrequently gives rise to pleural and pericardial effusions. In this affection we order light dry diet, moderate exercise, warm climate, little fluid, cholagogues, nitroglycerin, and occasional use of cardio-vascular diuretics. In obstructive lung disease, ammonia, senega, and the saline diuretics are generally useful, and the cardio-vascular tonics are often demanded. In pleurisy and pericarditis the salines are beneficial, but diuretics only take a subsidiary place in treatment. In cirrhosis of the liver, with ascites, there is an obstruction to the entrance of fluid into the systemic vessels, hence the supply should be strictly limited; we should use vasomotor and cardiac tonics, so as to lessen the size of the vessels supplied by the splanchnic nerves, and by raising the arterial tension drive the blood under pressure through the portal system. All alcohol should be stopped, and mild saline purgatives should be given. The best drugs for the vascular system and kidneys are digitalis, strychnine, caffeine, strophanthus. Tapping, although only a palliative process, should be adopted early and as often as necessary, as any rise in the intra-abdominal pressure interferes with the function of the kidneys. A large number of cases of ascites are curable if properly treated. In hysteria and other nervous diseases, accompanied by diminished urine, we can order pure water or whey freely, vasomotor tonics, and saline diuretics. In local œdemas similar treatment is applicable, but purgatives are usually more freely required. If there be a recent thrombus, the free administration of strong solutions of ammonia is necessary to remove the obstruction. In inflammatory affections the potassium salts are especially serviceable. In the dropsy attending acute Bright's disease there is defective elimination of water, with consequent hydræmia, the capillaries are overloaded, and the velocity of blood in them is diminished. In the early stages it is important to combat the inflammation of the kidneys, and for this purpose local or general blood-letting and antimony are the most effectual agents. The quantity of fluid ingested should be regulated by the state of the emunctories. In this form of dropsy the free action of the skin is most important, not so much for removing the dropsy as for relieving the kidneys and getting rid of waste products. The emunctory function of the skin is great, and offers the best substitute for inactive kidneys. The bowels should be at first well unloaded with a good cholagogue purgative, and afterward there should be one free evacuation daily. When the inflammation has subsided and the circulation in the kidneys is restored, we should encourage the free discharge of urine. The best diuretics in these cases are potassium bitartrate, acetate, citrate, and bicarbonate, ammonium benzoate, and, we may also add, sodium and lithium salts. When the dropsy is subsiding, mild alkaline waters and they may be given in abundance. In obstinate and chronic cases we may use more stimulating diuretics, such as squill, sweet spirit of nitre, juniper, etc. When the heart's power is flagging and the blood requires more motion imparted, then digitalis, caffeine, and strophanthus are demanded. Of course, the diet should be non-nitrogenous, and the patient kept warmly clothed. In conclusion, diuretics are mere adjuncts to treatment; there is

no disease or process of disease treated purely and simply by their use. The number of valuable diuretics in the *Pharmacopœia*, or outside of it, is extremely limited. If you attend to the indications for their employment, you will have no difficulty in selecting from the limited number the suitable diuretics for use in any particular case. You will not infrequently find your art baffled, which may make you try something new, only to find that it is not a true diuretic; but whatever drugs you employ, administer them with a strong infusion of common sense from which all credulity has been eliminated.—*British Medical Journal*, 1897, No. 1928, p. 1697.

MEDICINE.

UNDER THE CHARGE OF

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Bacteriology and Pathology of Sero-fibrinous Pleurisy.—LE DAMANY (*La Presse Médicale*, November 24, 1897, p. 329) concludes from his researches on the bacteriology and pathology of sero-fibrinous pleurisies:

1. That sero-fibrinous pleurisies, where the effusion contains micro-organisms other than the bacilli of Koch, are not due to the action of these micro-organisms on the pleura.

2. That the pleurisy may be primary; in this case it is always tuberculous. The presence of ordinary micro-organisms in the effusion is accidental, and their discovery cannot be used as an indication of the nature of the pleural inflammation.

3. The pleurisy may be secondary and non-tuberculous. Then the pleural inflammation arises by the extension of a pulmonary lesion or by a sort of collateral fluxion. The cause of the effusion is in the lung (infarct, congestion, hepatization). Whether the pulmonary lesion is aseptic or infectious, the presence of the microbes in the pleuritic fluid is still accidental and exceptional.

4. There is but one idiopathic sero-fibrinous pleurisy—it is the tuberculous pleurisy. The other sero-fibrinous effusions are symptomatic of a concomitant pulmonary lesion, which they never outlast.

He studied eighty-two cases of pleurisy, which he divided into two groups:

1. Fifty-five primary pleurisies, in all but four of which the pathogenic action of Koch's bacillus was demonstrated. Eleven occurred in patients with outspoken tuberculosis, of which two died of an acute miliary spread; one post-traumatic case; one in a case of nephritis; one in an individual with aneurism of the aorta; one in the course of progressive pernicious anemia; one in a case of heart disease. All these pleurisies were tuberculous.

2. Non-tuberculous pleurisies, of which there were eleven. Four of these

were in association with pneumonia; three in rheumatism with cardiac complications; three in cases of cancer.

In carrying out his investigations no new methods were used, but great care was used in the clinical examinations, cultures, inoculations, and pathological study.

The inoculation experiments were made on guinea-pigs. As large quantities of the fluid as possible were injected into the peritoneal cavity of the animal. He has injected into the peritoneum of a single guinea-pig as much as 300 c.c. of pleuritic fluid in weekly doses of 10 to 50 c.c., according to its toxicity.

He thus inoculated fifty-five pleuritic fluids, and produced tuberculosis in the animal in forty-seven instances. In eight instances negative results were obtained, the greater part of which were to be attributed to inoculation with insufficient doses. Among these eight negative results four were from cases with sero-fibrinous pleurisy without other micro-organisms or culture, pleurisies coming on in individuals having outspoken tuberculosis of the apices. It seemed fair to assume that these cases were tuberculous. One of the four pleurisies remaining had obstinate symptoms, large relapsing effusion without ordinary micro-organisms, and the clinicians believed the case to be one of tuberculous pleurisy. Only 10 c.c. of fluid were inoculated from another case, so that the negative result is without much value. In a third case he inoculated but 20 c.c., and in a fourth 50 c.m. of fresh pleuritic fluid.

These results show that it is generally possible to demonstrate the presence of tubercle bacilli in the fluid of primary sero-fibrinous pleurisies by this method of inoculation. In fact, tubercle bacilli were demonstrated in practically seven out of every eight cases of primary pleurisy. If to the forty-seven positive cases the four negative, which were undoubtedly tuberculous, are added, Le Damany's results showed 92 per cent. of the fifty-five cases of primary pleurisy to be tuberculous.

Culture methods, he believes, lead many observers astray. He holds that it is a mistake to conclude from the development alone of a parasite in cultures from a pleuritic fluid that this micro-organism is the pathogenic agent of the pleurisy. He obtained in eighty cultures from pleuritic fluid but eight positive results in aerobic cultures. Anaerobic cultures had always given negative results. Sixty-eight of these pleurisies were primary or came on in the course of pulmonary tuberculosis (eleven cases). From these cases there were obtained seven positive results.

When compared with the inoculation experiments, these culture results are interesting. Among the organisms found in the cultures were the pneumococcus, staphylococcus albus, micrococcus tetragonus, and bacterium coli communis. The inoculation of the pleuritic fluid from these same cases produced tuberculosis in the inoculated animal. The writer thus believes that these organisms play an unimportant rôle in such cases, and he thinks they are conveyed to the pleura by phagocytes.

The pathological study of sero-fibrinous primary or secondary pleurisies enables one to divide them into two large groups:

1. The primary or tuberculous pleurisies.
2. The secondary or non-tuberculous pleurisies.

The evolution of primary tuberculous pleurisy goes through three stages:

a first, corresponding to the formation of a new-formed tuberculous membrane on the surface of the pleura; a second, characterized by the development of the effusion and the arrest of the pleural tuberculosis, is favorable, the effusion in moderate amounts being a conservative factor; a third, marked by the absorption of the serous fluid and the organization of the fibrinous false membrane which covers the new-formed membrane, cannot be absorbed, and is very thick toward the inferior part of the pleura.

The pathogenesis of secondary, non-tuberculous, sero-fibrinous pleuritis is not more complex than in the primary tuberculous form. Omitting those due to cancer, these are practically always due to a pulmonary lesion. These result from pulmonary infarcts or from subpleural pulmonary hepatization. These pleuritis are not due to the pneumococcus, since it is rarely found in cultures or by inoculation of mice. Pneumococcus pleuritis are nearly always purulent.

In *résumé*, there is but one sero-fibrinous primary pleuritis, according to Le Damany, namely, tuberculous pleuritis. It alone is due to the penetration of a micro-organism into the pleura. It is the only form in which the effusion contains more or less constantly the pathogenic agent—the bacillus of Koch. It is, then, the only one in which the fluid, normally, is not sterile. The ordinary micro-organisms which are found exceptionally in these primary pleuritis play no rôle so long as they do not become purulent; their presence is purely accidental.

Glycosuria in Primary Cancer of the Pancreas.—BARD and PIC (*Revue de Médecine*, December 10, 1897, No. 12, p. 929) discuss this interesting question again, after having published a memoir on it in the same journal in 1888. In their earlier communication they asserted that the symptoms of pancreatic cancer were quite characteristic and could be classified into two groups. In one group the symptoms were positive: occurrence of emaciation and rapid cachexia, icteric bronzing, distention of the gall-bladder, sometimes pain, and a tumor in the epigastrium; in the other, negative: absence of swelling of the liver and spleen, absence of ascites. To these symptoms Hanot had applied the term the "Bard-Pic syndrome." Other symptoms, such as steatorrhœa, lipuria, and glycosuria, considered of first importance by some observers, Bard and Pic held were not cardinal symptoms of the disease. The importance of distention of the gall-bladder in cancer of the pancreas, in contrast to its contracted state, usually observed in icterus due to gall-stone obstruction, had been emphasized by other observers.

Some clinicians, among them Litten and Lachmann, consider that glycosuria is of the greatest value in the diagnosis of pancreatic cancer. Bard and Pic failed to find sugar in the urine in any of the seven cases which they reported in their first paper, and Parisot and Caron regard glycosuria as a rare symptom.

Mirallié, recognizing this difference of opinion, collected in 1892 all the cases of primary cancer of the pancreas he could find in the literature, and analyzed them with especial reference to the frequency of the occurrence of glycosuria. He collected 113 cases in all; in fifty of the cases it was definitely stated that sugar was searched for in the urine, and in thirteen of these it was found present. An alimentary glycosuria was present in two of the

remaining thirty-seven cases. From the study of each of these thirteen cases, Mirallié found that in the majority of instances glycosuria had been absent for as long as eleven months before the termination of the disease. He concluded that in the evolution of cancer of the pancreas there are two distinct periods—an early glycosuric and a later non-glycosuric.

Bard and Pic express some doubt as to whether glycosuria occurs even as commonly in the early stages of the disease as Mirallié would lead one to believe, because all their seven cases which they reported came under observation between seven weeks and six months of the onset of the symptoms. They state that the importance of glycosuria as a symptom of primary cancer of the pancreas has passed through three phases: At an early period glycosuria was considered a common symptom and an important one in the diagnosis of the disease; in the second period, which corresponded with their memoir published in 1888, its diagnostic value was not considered of much importance; in the third period, inaugurated by Mirallié, a new importance was assigned to glycosuria in the evolution of cancer of the gland, in that it was present during the early stages and absent during the later stages of the disease.

The writers now take up the question again in this article, with the object in view of ascertaining more definitely the actual frequency of glycosuria in primary pancreatic cancer, and also of explaining some of the phenomena in connection with it. They state that from their personal observations, and from the study of the cases related in the literature with sufficient detail from which to draw conclusions, it is possible to divide the cases of glycosuria into two definite groups: first, those where there was simple glycosuria, and secondly, those in which the glycosuria was associated with definite clinical symptoms of true diabetes.

They then report at length personal observations on two fatal cases coming under the first category and on which autopsies were obtained. The point of interest on which they dwell was the occurrence of sclerosis of the pancreas and a cirrhosis of the liver running parallel one to the other, the former being due to obstruction by pressure of the duct of Wirsung and the latter of the ductus choledochus. It is to this sclerosis of the pancreas and not to the effect of the cancer that Bard and Pic attribute the glycosuria. Seven of Mirallié's cases belonged to this group.

The cases of primary cancer of the pancreas associated with glycosuria and true diabetic symptoms are then taken up. The writers do not give notes of any personal observations, but they review the cases published in the literature belonging to this group. Four of Mirallié's cases were cases of glycosuria with clinical symptoms of diabetes. After reviewing these cases and some others published after Mirallié's communication, Bard and Pic are led to believe that some of them were instances in which the diabetes antedated the appearance of the pancreatic cancer, and hence that the former was entirely independent of the latter. This would then tend to diminish the percentage of the cases of glycosuria actually due to cancer of the pancreas. They have been able to collect from the literature, since the publication of Mirallié, thirty-seven new observations on primary pancreatic cancer. In only four of these was glycosuria present. In other words, up to the time of publication, 150 cases of primary cancer of the pancreas had been recorded

in the literature, with only seventeen instances in which it had been stated that glycosuria was present. In many of the cases no mention of a urinary examination is made, so that it is possible that sugar may have been present and had not been observed. It is thus possible that the number of cases of glycosuria may be greater than seventeen. On the other hand, Bard and Pic believe that in some of the cases recorded the diabetes was primary, which would leave really a smaller number that could be definitely attributed to cancer of the pancreas.

These observers explain in a very interesting way the disappearance of glycosuria and the diabetic symptoms observed in many of the recorded cases. They claim that the glycosuria in the early stages is due not to the direct effect of the cancer, but to the sclerosis of the gland produced by pressure of the tumor on the excretory duct. They support Lépine in his view that pancreatic diabetes is due to the suppression of an internal glycolytic ferment which enters the general circulation under normal conditions. The explanation they suggest for the disappearance of the glycosuria in the late stages is, that the cancer-cells take on not only the histological characters of the pancreatic cells, but also their physiological function of producing the glycolytic ferment, which in the early stages of the disease is diminished or absent, owing to sclerosis of the gland-tissue. This restoration of the glycolytic ferment leads to the normal transformation of the carbohydrates and the consequent disappearance of the glycosuria.

Scarlatinal Albuminuria.—DITTMAR (*Glasgow Medical Journal*, December, 1897, p. 426) publishes the results of his observations on the urine of ninety-one consecutive cases of scarlet fever admitted to the wards of the City of Glasgow Fever Hospital during a period of six months. The patients varied in age from one year and two months to fifty years, the majority, 84.6 per cent., being under fifteen years, and 62.6 per cent. being under ten years of age.

At least two specimens of urine from each patient, voided about 6 A.M. and 6 P.M., were examined daily. In some cases as many as three or four specimens from each patient were daily analyzed, and in all over ten thousand specimens were examined for albumin and hæmoglobin. Most of the cases remained in the hospital for fifty-six days.

Albumin or blood-coloring matter, or both, were detected at some period during the stay in the hospital in forty-eight (52.7 per cent.) of the cases examined, and of these twenty-nine (60.4 per cent.) were under ten and thirty-nine (81.2 per cent.) under fifteen years of age. In most of the cases the quantity of albumin was small, and could be detected only by careful testing. In some cases merely an occasional trace was detected; but in others the albumin persisted in the urine for weeks, and was sometimes very considerable in amount. In some of the cases "blood" alone seemed to be present, the albumin bearing, as far as it was possible to judge, a proportion to the hæmoglobin such as exists in normal blood. In other cases both blood and albumin were found, the amount of albumin being out of all proportion to the hæmoglobin as it exists in normal blood.

There was no particular date on which albumin seemed particularly prone to appear, although a relatively larger number of the cases showed the pres-

ence of an abnormal constituent during the latter half of the first week, during the second week (ninth to the twelfth days), and on the thirty-first day than at any other period of the illness. The cases seemed to divide themselves into two groups: (1) Cases of "early" albuminuria, and (2) cases of "late" albuminuria. Twelve of the cases came under the heading of "early" albuminuria. In nine of these twelve cases the albumin disappeared only to reappear again later in the disease, the interval during which the urine was free from albumin varying in these cases from three to forty-eight days.

Mahomed claims that in some cases of nephritis, notably in scarlet fever, one sometimes observes a stage in which only blood-coloring matter can be detected in the urine. This stage he terms the "pre-albuminuric stage." The explanation advanced was that early in the disease there is observed a condition of high tension in the arterial system, which, if sufficiently severe, leads to transudation of hæmoglobin before the appearance of albumin in the urine. A similar but converse phenomenon is sometimes observed during the decline of a nephritis, the albumin disappearing first, the hæmoglobin later. Dr. Thomson has suggested the term "post-albuminuric" stage for this period. Dittmar was not able to confirm these observations in the study of his cases.

The conclusions that Dittmar arrives at are as follows:

1. That albuminuria or hæmaturia, or both, occurred in 52.7 per cent. of the cases observed.
2. That the cases seemed to divide themselves naturally into three classes: (a) Those of pure albuminuria in which albumin only was detected; (b) those of hæmaturia, in which "blood" seemed to be present; (c) those of albuminuria and hæmaturia, the albumin being greatly in excess of the hæmoglobin as found in the blood.
3. That dropsy or œdema of the superficial parts was observed unmistakably in only three of the cases.
4. That a "pre-albuminuric" and a "post-albuminuric" stage (if the word be allowed) do not exist in the proper sense of the terms.
5. That a pulse of "high" tension was not an invariable accompaniment even of undoubted nephritis.

The Smegma Bacillus.—Important additions to our knowledge of the smegma bacillus have been made by CZAPLEWSKI and LASER (*Munch. med. Woch.*, 1897, No. 43). These observers have been able to cultivate the organisms. Czaplewski used nutrose-serum-agar; Laser used agar smeared with human blood. The colonies grow rapidly, resembling those of streptococci or diphtheria bacilli. The tenacity with which the bacilli resist acids in decolorizing was preserved in the cultures, proving that the resistance is not due to fat from the medium, but to some other cause. Laser was unable to discover any pathogenic action in white mice and guinea-pigs. The practical importance of these investigations, if confirmed, is very great. Within twenty-four hours a culture can be obtained. The appearance of the colonies and the peculiar staining reactions, combined with the rapid growth, make it easy to distinguish the organisms from others, so that inoculations, requiring as they do so much more time, will no longer be necessary.

The Sputum in Cancer of the Lung.—HAMPELN (*Zeitschrift für klin. Med.*, Bd. xxxii., p. 247) gives the results of a rather rich experience. He agrees with former writers that the hemorrhagic character of the sputum is important, though he claims there is no characteristic tint. Moderate and temporary hemorrhages are more likely to be encountered, though in rare cases the bleeding is prolonged—to two months in one case—and copious. As to the microscopic characteristics of the sputum, it has heretofore been held that only the finding of actual bits of broken-down new-growths is of diagnostic value, yet such bits have been rarely found, only once among the authors cited. Hampeln has made careful comparative examinations of the cells found in the sputum in various diseases. He holds that the normal, non-pigmented polygonal cells of the alveoli occur so rarely, if at all, in sputum, that they do not play a great part in differential diagnosis. When in disease cells are found which plainly differ from the ordinary pavement and cylinder cells of the mouth or air-passages—cells which are non-pigmented, polymorphous, polygonal, of various sizes, sometimes gigantic, with plain nucleus and nucleolus, single or in masses—the diagnosis of new-growth is permissible. The seat or origin of the growth cannot be determined from the character of the cells, so that a distinction between bronchial and pulmonary cancer is not possible. A number of illustrations of cells of various kinds, including some from cases of cancer, add to the value of the article. It is interesting because it shows the reaction against the idea long prevailing, that there is nothing diagnostic about the cells of new-growths. That these are not specific in shape, as was once thought, is, of course, admitted by the author; yet there are many details of size, shape, character of nucleus, and staining properties that, when considered in relation to their source, may enable an experienced observer to draw conclusions of value.

Mucus in Stools.—ADOLF SCHMIDT, who has done such useful work in the application of staining-methods to mucus in sputum, has made a valuable contribution to the present subject, one that is all the more important because the examination of feces is strangely neglected by many. Although the result of the present work may seem trifling, yet it includes a revision of many points that were long thought to be settled, but in fact were not. The details are indispensable to clinical investigators, but it will suffice here to give some of the author's conclusions. The conception of a special disease, enteritis membranacea, cannot be based on the quantity and shape of mucus in the stools. The clinical picture described by Nothnagel under the name of colica mucosa may, however, be separated from other forms of enteritis.

The basis of most membranous bodies in feces is mucin. The refractoriness of these masses is due to the constant presence of fats and soaps in considerable quantity. Fibrin has never been positively demonstrated in the mucous discharges. The number of round cells in intestinal mucous is not always so small as might be supposed from the examinations of fresh preparations. For the diagnosis of ulcerative processes, the absence of mucus among the cells is more important than the appearance of large numbers of round cells. We have at present no certain guides to the sources of mucus or the cells in the mucus. The strongest evidence of a source in the small intestine is the digestion of the cell bodies, leaving the nuclei free. Except

in case of very rapid transit through the intestine, mucus never passes undissolved from the small intestine to the anus.—*Zeitschrift für klin. Med.*, Bd. xxxii., p. 260.

Bacteriuria.—R. BARLOW (*Deutsches Archiv für klin. Med.*, Bd. lix., p. 347) has gathered together from the literature and his own experience notes on sixty-five cases of bacteriuria. In these sarcinæ were present in twenty-two cases; colon bacilli nineteen times—seventeen in pure culture, twice with staphylococci; the latter alone in three cases; in one each an H_2S -forming bacillus and an undetermined bacillus. With regard to the source of the bacteria, it is interesting to note that, although albumin has been noted in some cases, there is an important error in such determinations, since the heat and nitric-acid test gives an opacity in bacteriuria sometimes when other albumin tests fail. In no cases have casts been found, unless there was a complicating nephritis or heart disease. The renal origin is, therefore, not yet demonstrated. The theory of Posner, that the bacteria come from the intestines, is not looked on favorably by the author. His objection is based on the negative results of the bacteriological examination of the blood, the sterility of the pelvis of the kidney in a case of Krogius, the absence of turbidity in the urine as it comes from the ureters, and the absence of signs of intestinal putrefaction in the urine. That the bacteria come from the urethra is negated by the large number of coli infections and the relative scarcity of staphylococci, in marked contrast to the relative frequency of these forms in the urethra. Barlow inclines to the belief that the infection often takes place by means of lesions of the intestine, citing such lesions as fissures or lacerations of the anus, fistula *in ano*, and even severe massage of the prostate and seminal vesicles through the rectum.

Even more difficult to explain than the source of the urinary infection is its seat. In a case of Goldenberg's the bacteria seemed to come from the seminal vesicles, but in general we are completely ignorant of the seat of reproduction of the bacteria. They certainly do not live only in the bladder, or the difficulty of removing the condition would be much less than it is. As to the symptoms, the urine is always turbid, opalescent, and looks, especially when shaken, as if fine powder were suspended in it. Colon bacilli usually cause a fetid odor. The reaction is acid, alkaline, or neutral. In rare cases the urine is ammoniacal. On standing, a sediment usually forms, consisting exclusively of bacteria and mucus. The supernatant fluid, however, does not clear, but may become more turbid. Albumin, and at times sugar, may be present. Subjective symptoms may be absent, or there may be local symptoms of variable severity, from tickling in the urethra to severe irritation and shooting pains, and even malaise, fever, enlarged spleen, and chills.

The diagnosis is easy, if the urine is passed in several portions and the examinations made at once. Prognosis is not altogether favorable. Remissions are frequent, and the disease may last for years (fifteen in a case of Finlayson).

The treatment should be antiseptic, salol internally, and silver nitrate or argonin locally, being very useful. Disease of urethra, prostate, and seminal vesicles must be considered.

SURGERY.

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A Case of Wandering Œdema.—MASTERMAN (*British Medical Journal*, April 3, 1897) reports an interesting case of œdema which he considers to have been probably due to septic infection. The patient was a boy, aged eight years; the œdema first made its appearance after a period of pain in the left leg, which became very much swollen and tense, with purpuric patches, irregular and raised. The left arm was next involved, and then the head; both upper eyelids were intensely œdematous; also the area between the eyes and over the temples. The pulse was slightly quickened and the temperature was a little over 100° F.; its highest point was 101.2° F. The lower eyelids, ears, and occipital regions were next involved. Then followed an œdema of the right arm, then of the back, the œdemas disappearing in the same order in which they made their appearance, the vesicles becoming purulent and then drying up.

The attack was closed by a severe acute dysentery. Blood and matter were very copious and tenesmus severe.

The treatment employed was quinine internally, extract of belladonna with glycerin externally and later lotio plumbi cum opio.

External Pharyngotomy for Epithelioma.—MORTON (*British Medical Journal*, March 27, 1897) reports a case of epithelioma of the tongue which involved the right tonsil and floor of the mouth and in which he removed, by an operation similar to Kocher's method for excision of the tongue, the tonsil, floor of the mouth, and half of the tongue. The patient made a complete recovery, and there was no sign of return six months after the operation.

The author did not ligate the external carotid artery; he divided and turned apart the divided portions of the lower jaw, so as to give free access to the tonsillar region for the purpose of dealing readily with all bleeding vessels.

The patient was fed by a tube passed into the stomach, which was left in position; attempts at swallowing were thus avoided, and no food got into the mouth; moreover, the patient began at once to take large quantities of nourishment.

The patient was tracheotomized prior to the operation and the pharynx packed with sponges. The tracheotomy tube was retained for ten days and

the stomach tube for rather more than a month, but by firmly plugging the external opening into the pharynx he could swallow three weeks after operation.

Cholecystitis and Infectious Angiocholitis due to Coli Bacillus—Cholecystotomy—Recovery.—LEJARS (*Gaz. Heb. de Med. et de la Chir.*, March 25, 1897) reports an interesting case of infection of the biliary passages by the coli bacillus.

He says we have to do in this case with a coli bacillus infection, without lithiasis of the gall-bladder and of the larger subhepatic ducts, and this infection has made itself manifest for two years by painful and febrile crises, which have latterly become more and more frequent. In addition the intervention took place during an acute attack, more acute and more severe than any of those previous, and had for its purpose the relief of symptoms typhoidal in nature and menacing a general septic nature.

The immediate relief produced by the cholecystotomy and drainage of the bladder was shown in the evening fall of temperature.

The case admirably demonstrated the results which such an intervention, so simple in its nature, affords. It also provided a method not only for the relief, but also for the cure of a chronic condition which had resisted all other forms of treatment.

A Case of Subphrenic Abscess followed by Empyema Successfully Treated.—MCNAUGHT (*British Medical Journal*, May 22, 1897) reports the following interesting case:

A well-nourished man, aged thirty-three years, was seized with severe epigastric pain and vomiting. His previous history showed dyspepsia, but no hæmatemesis. Morphine relieved the pain, and no further vomiting occurred.

Ten days later he had a severe, catching pain at the lower angle of the scapula. Coarse friction-sounds were audible at that point. There was a short cough, but no expectoration. Temperature 101° F., pulse 114. As there had been no exposure, the author suspected a rupture of the stomach and the formation of a subdiaphragmatic abscess. There were no signs of general peritonitis. Two days later a displacement of the lower border of the diaphragm was noted throughout its entire extent. The usual liver-dulness was replaced by tympanites, which extended from the lower costal margin as far upward as the nipple and as far back as the anterior axillary line. At the right base there was marked dulness extending from the inferior angle of the scapula, and this dulness was bounded anteriorly by a curved line running steeply down from the posterior axillary line to the costal margin. Breath-sounds were entirely absent over this area. Above the tympanitic area in front, and extending in a band two inches wide transversely along the nipple line from the sternum along the ribs to the back, there was also marked dulness. Above this the lung was resonant, and auscultation discovered moist râles. Dyspnoea was considerable, but there was very little expectoration or cough.

Forty-eight hours later the tympanitic area had increased, and splashing sounds could be heard entirely distinct from the stomach, whose tympanitic

area was also easily differentiated. A hypodermic needle drew fetid pus between the ninth and tenth ribs in the posterior axillary line, and an incision drew off a large amount of pus and gas. Serum was found in the pleura. The abscess-cavity was washed daily and drained. Pus was evacuated by aspiration after a fortnight from the pleural sac. It was, however, sweet. Resection of a rib was finally necessary, and after drainage and packing it healed.

The previous history leads the author to believe that the abscess was due to a small rupture of the stomach or duodenum, as the abscess-formation was slow. The amount of gas and the distention made the diagnosis easier.

In another case he would open the subphrenic cavity between the eighth and ninth ribs, and use siphon drainage earlier in the pleural cavity.

Chronic Prostatitis and Sexual Neurasthenia.—In discussing the relation of these diseases HOTTINGER (*Correspondenzblatt für Sch. Aertz.*, 1896, No. 6) says that many functional derangements of the genito-urinary system, which have been called purely nervous or symptoms of neurasthenia, have as their pathological and anatomical basis a chronic or other form of prostatitis, and that the so-called neurasthenia disappears as soon as this pathological condition has been cured. If these cases were only recognized early and treated properly, there would be a great diminution in the number of neurasthenic patients. A greater decrease, however, the author believes would follow the stamping out of gonorrhœa and the education of the public in the physiology of the sexual organs.

As a case in point, the author details the history of a patient who had had loss of power for four years and had detected the presence of semen in the urine for two years and a half. At the same time he had decreasing strength and loss of appetite and digestion. He had been treated for various diagnoses without avail. The microscopical examination of the urine disclosed the fact that there existed a prostatitis. The prostate was but slightly enlarged, was somewhat harder, but not especially tender; the expressed secretion showed a large number of leucocytes, some red blood-corpuscles, and spermatozoa.

Treatment *per urethram* and by drugs *per rectum* produced no results, and the patient did not begin to improve until massage of the prostate was carefully and systematically carried out. The patient improved rapidly and was cured, and was seen in perfect health two years after the time of his discharge.

Foci of Suppuration at a Distance from the Appendix in Cases of Appendicitis.—PIARD (*Arch. gén. de Méd.*, November, 1896), after considering the etiology, pathology, and symptomatology of these abscesses, considers their treatment and the indications for operation.

In considering the question of the removal of the appendix, he says that to insist upon the removal of the appendix in these cases at all hazards would be to increase markedly the gravity of the intervention. The indications are in some cases absolute, in others relative. In the presence of suppuration situated at a distance from the appendix, he says the indication for removal is only absolute in the following cases:

1. When a perforating appendicitis has produced a cystic peritonitis of multiple foci.
2. When the inflamed appendix threatens to become the origin of a general septicæmia.
3. When the appendix keeps up and renews the infection in the foci at a distance.

In all other cases the resection of the appendix is less urgent.

The author makes the following *résumé* of his study of this subject:

1. Abscesses are observed at a distance from the primary focus of infection in cases of appendicitis.
2. They are situated in various regions, some of which are the iliac cellular tissue, the peritoneal cavity, in the anterior abdominal parietes, in the liver, in the pleura, in the lung, and in various organs situated at greater distances, as the brain, parotid glands, kidney, and spleen.
3. These abscesses are peculiar in that they do not infect surrounding tissues even when at a distance from the appendix, and are thus readily differentiated from periappendicular abscesses in abnormal situations, due to a vicious situation of the appendix.
4. These abscesses are the expression of a diffuse appendicular infection produced by means of a peritoneal contamination, sometimes through the channel of the vascular system of the appendix by its connections, physiological or pathological.
5. They present in their variety all the transitional stages between a local inflammatory process and general septicæmia. They permit us to conceive of a new chapter to add to the autoinfections of internal origin.
6. These abscesses are rare. Their recognition will result in a more precise knowledge of the indications for operation in the surgical treatment of appendicitis.

Silver Salts as Antiseptics.—CREDE (*Cent. für Chir.*, October 24, 1896) published a monograph upon this subject in May. The results he obtained have been confirmed by his own and his assistants' observations since that time, and by over one hundred of his surgical colleagues who have used these antiseptics since then. He believes that, though the antiseptic method may not be as near the ideal as the aseptic, it is more practical in the majority of cases. This is not because he believes the results that can be obtained by strict asepsis are not so good, but because as good results may be obtained in a simpler manner, in less time, with less labor, and at less cost.

The ordinary preparation of the hands and the employment of dressings, aprons, dishes, etc., that are not sterilized, but are made antiseptic, save time and labor. Only the instruments are boiled. Thus much labor is saved, as also in the changing of dressings, as these are smaller and simpler than the aseptic. The small amount of dressing is very marked, and makes a material difference in the total expenses of the year. The security of the silver salts as antiseptics lies in the fact that they are mild but energetic antiseptics. Germs are destroyed by them of which asepsis cannot take note, and they are more efficient than other forms of antiseptics.

The method which he has employed for nearly a year is the following: wounds which the surgeon makes are covered, whether they are sutured or

not, with a dressing of silver gauze; occasionally the line of incision is strewn once with a powder, itrol (arg. citric.), to prevent more surely a secondary infection of the wound; over this is placed silver gauze, which contains, in fine powder, metallic silver; it is absolutely non-irritant, and can be sterilized, although this is unnecessary; it becomes antiseptic just as soon as pathogenic micro-organisms develop in the wound, since the lactic acid which they produce forms with the silver a combination which is an energetic germicide.

In old wounds, after a thorough cleansing of the surrounding skin, the wound and surroundings are washed with a 1 to 2000 bichloride or a 1 to 5000 silver solution. Dependent tissue is removed and large undermined areas are laid open; smaller crevasses and joint-surfaces are left alone, and the surface of the wound is powdered over lightly with itrol. If inflammatory processes have resulted, he applies a wet antiseptic dressing for a few days; and when no reaction is visible he applies silver gauze, then cotton, and places the part at rest by a bandage and fixation. When the dressing becomes partly soaked with blood and serum he attempts to dry the dressing or reinforces it with cotton. When the secretion is very great he changes the entire dressing. The contact of the secretion with the air is of no moment, as the wound is securely protected from infection. If pathogenic micro-organisms had already found entrance into the deeper tissues, they can but produce an abscess, which is treated as such. The dressing, when it remains dry, is changed for the first time on the fifth to the tenth day. No eczema or argyria has ever been observed from the use of this antiseptic dressing.

Actol (arg. lactic.) and itrol (arg. citric.) are the two forms of this silver antiseptic which can be obtained in powder or tablet form suitably prepared for making standard solutions. Silver gauze can also be had, and the author warns the profession that there are certain preparations which are not of proper strength or stability, while those which he employs are stable in any climate and for any length of time. They should be kept, however, away from the light, or their efficiency will be slightly affected after a lapse of some time.

The stains produced by the silver may be removed by placing them for a few minutes in the following solution: 1 part sublimate, 2000 parts of water, 25 parts of salt.

Resection of the Superior Maxilla.—WILDT (*Centralblatt für Chirurgie*, 1897, No. 18) describes a new osteoplastic method, by Bardenheuer, for the closure of the palate defect after excision of the superior maxilla. The flap is made from the nasal septum in the following manner: The ordinary incision is made, except that it is directly in the median line, through the upper lip, and then up through the median line of the nose, with a lateral incision carried beneath the eye in the ordinary manner. After the formal resection of the maxilla has been performed, the osteo-mucoid flap is formed by cutting through the nasal septum, just above the osteo-cartilagenous junction, with cutting-forceps, the incision being carried in a curve backward and downward to the hard palate. An incision is then made parallel to the bridge of the nose from the anterior end of the upper cut down to the hard palate, an eighth of an inch from the anterior border of the septum. The flap is now free on all but its inferior margin, where it is attached to the

hard palate. This attachment is now divided for one-third of its breadth to make certain that the flap breaks at the desired level. The flap is now gradually bent down by first introducing one and then two fingers behind it; its posterior border is united to the soft palate, while its anterior and upper border is attached to the mucous membrane and muscles of the upper lip and cheek.

The advantages gained are manifest. There is a complete separation of the nasal from the oral cavity. Speech and swallowing are facilitated, and it is possible to remove much more of the diseased or suspected mucous membrane, and consequently recurrence is less liable to occur.

Catgut or silk sutures are employed. There is comparatively little bleeding more than in the ordinary operation, and the closure of the wound is the same in all other respects.

A Case of Brain-cyst with Jacksonian Epilepsy; Operation followed by Relief.—CABOT (*Boston Medical and Surgical Journal*, June 3, 1897) reports a very interesting case in which the gradual onset of the symptoms was well marked and carefully studied by an intelligent patient.

The history was that of a disturbance of nerve function beginning two years before, and at first only affecting the leg-centre at the upper part of the fissure of Rolando. Gradually the irritation extended down along the fissure of Rolando to the centres of the abdomen, shoulder, arm, and face. The degree of functional interference with these centres was also gradually increasing, until he had a temporary paresis of the muscles following each attack. As the irritation reached the shoulder-centre it had attained a sufficient degree of intensity to affect the sensorium, and led to a general convulsion.

It was necessary to consider the possibility of tumor, including cyst, tubercle, and gumma, and also of some degenerative changes in some way connected with the old injury to the cranium, which was a blow by a heavy stick twelve years previously, either through the irritation caused by a depressed spicula of bone, by an adhesion of the membranes, or by some change originating in an injury of the brain substance itself.

The absence of severe pain so characteristic of the invasion of the brain tissue by a tumor, and the slow development of the symptoms, led him to regard the gliomatous or sarcomatous tumor improbable. The history did not point to a gumma or tubercular tumor. On the other hand, the history of the injury to the head was so clear as to lead to it in seeking a cause for the symptoms. With so exact a location it was determined to operate.

The operation was done in two stages. An osteo-cutaneous flap was formed, and then, five days later, the dura was opened; the brain bulged, and did not have a normal pulsation. It was also noticed that the cortical portion of the brain had a yellowish color toward the upper part of the opening. Stimulation of this area produced no result, and it was only by stimulation anterior to this area that motion in the arm could be induced. The yellow area was punctured, and brownish serum escaped. The cyst was opened. It was the size of a pullet's egg, with a very thin wall and no connection at any part with a tumor.

Total removal was impossible, so the cyst was drained with strands of silk.

The patient made a quick recovery, and the drain was removed on the third day. The patient went home sixteen days after the operation with everything solidly healed.

For one month and a half he remained free from symptoms, then the aura returned. By the use of bromide he so far recovered that three months after recovery from the operation he went West and began to work. Later he began to work harder, with the result of bringing on more severe attacks. They continued to grow worse, and he finally returned for further operation, which was performed fifteen months after the previous operation. The size of the cyst cavity was found to be much larger, but the wall had the same character. The attempt was made to remove the wall, but it was impossible; wick drainage was introduced of gauze until a suitable drainage-tube could be made. The tubes were made the shape of a shirt stud, the stem being 20 French in size, perforated sufficiently to give good drainage. One just small enough to have the smaller end enter the cavity was introduced, and the drainage was much more free than with the gauze. The patient was up on the seventeenth day, and went home on the twentieth, but the button was not removed till the forty-fourth day, when the cavity was obliterated. The patient has since—two years—been free from any further seizures, and has apparently been completely relieved from further trouble. The contents of the cyst fluid made it probable that it was of traumatic origin, although there was no pathological examination of its wall.

Lorenz's Non-cutting Method of Treating Congenital Dislocations of the Hip.—ELLIOT (*Medical Record*, May 29, 1897) describes this new method, with which he says he has had unqualified success, as follows:

The first step in the operation consists in the reduction or bringing the head of the dislocated thigh to the level of the acetabulum. The patient is anaesthetized to a degree of extreme muscular relaxation. If manual extension is insufficient, which is frequently the case, a band is passed around the perineum, protected by padding, and a soft band is put about the ankle. This latter band is attached to a screw-extension apparatus. The extension is now very carefully and evenly exerted. The operator grasps the muscles of the thigh with one hand, while the other is kept on the dislocated joint. As the extension gradually goes on the operator manipulates the thigh muscles, increasing their tension by intermittent pressure against the femur beneath, while with the hand upon the joint he appreciates the descent of the trochanter. The extension is stopped when the upper margin of the trochanter is at or just below Nélaton's line. While the extension goes on the pelvis on the diseased side is drawn down, causing some abduction of the thigh. This abduction is desirable to exert increased extension of the adductor muscles abnormally contracted. Fracture is to be avoided through care in having the extension uniformly exerted.

The next step is the reposition after the head has been reduced to the acetabulum.

Here is the chief difficulty of the operation, due in the main to changed anatomical findings.

The anterior fibrous wall of the capsule hugs closely to the surface of the acetabulum, and is rendered more taut by the extension. The acetabular

space must be opened as much as possible. This is largely accomplished by flexing the leg on the thigh, and the latter at right angles, which relaxes the anterior capsular wall.

The head of the femur must now be given an approximately frontal direction, thus turning it toward the hiatus of the now relaxed capsular pocket. Although the head is in the proper position to enter the acetabulum, no amount of manual force will drive it in.

The operator, standing on a stool, seizes the thigh, flexed at right angles to the trunk, with one hand, and, with the other grasping the head of the femur, he, by a system of extension combined with rotation and gradually increasing abduction, opens the way into the dormant-lying acetabulum pocket. When the abduction, which must be gradually exerted, has reached a considerable degree, the head of the femur, still manipulated by one hand, is felt to leap over the posterior edge of the acetabulum, and the surgeon feels at once that reposition has taken place. A distinct noise is clearly heard.

The dislocation may recur. To prevent it the angle of abduction must be maintained at not far from 90°. The leg is held in this position by a fixed plaster dressing.

The pain of the operation subsides in a day or two, and the patient is urged to walk. It is advisable to add a few inches to the shoe of the foot of the diseased side and give some support at first, but this walking about constitutes one of the most important parts of the treatment. Growth is reawakened, the parts are reactivated, and a nearthrosis is gradually built up.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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Trophic Keratitis in Caisson Disease.—GEO. C. HARLAN (Philadelphia) reports the case of a man, aged twenty-nine years, who had worked in a caisson under atmospheric pressure increasing from eighteen to thirty pounds in the course of three months. Fellow-workmen had been taken out unconscious, one had died, and one was said to be paralyzed. He had suffered for a month from occasional numbness of the right side, and when obliged to quit work the right eye had commenced to be irritable and painful. Six weeks later it presented a superficial ulcer with infiltration and ill-defined margins. The whole cornea was steamy, but not vascular. Slender posterior synechiæ showed a moderate iritis. There was almost complete anæsthesia

of the cornea and conjunctiva and other parts supplied by the first and second branches of the fifth nerve. There was no motor paralysis. The corneal ulcer increased and hypopyon appeared; but perforation of the cornea did not occur, and the eye gradually improved, although still remaining insensitive.

As bearing on the nature of this disease, Harlan points out that the cornea will sometimes slough if exposed, although perfectly sensitive, but it will by no means always do so when insensitive. And he instances a case in which the insensitive cornea remained clear and bright until a progressive lesion produced ptosis, and the cornea was protected from the atmosphere when it rapidly sloughed.—*Trans. Amer. Ophthal. Society*, 1897, p. 103.

Syphilitic Dacryoadenitis.—H. E. JULER (London) says that symmetrical enlargement of the lachrymal glands is, perhaps, one of the rarer affections of the appendages we are liable to meet with, and he has little hesitation in attributing many instances of this condition to syphilis. These tumors start in the upper and outer part of the orbit, first in one, then in the other. Small nodules are felt at first, which multiply until symmetrical lobulated tumors exist, arching inward over the eyeball. Ptosis is the first obvious sign, though puffiness and even slight redness of the eyelids may be noticed. The periosteum may be very extensively involved, so that the nerves and even the muscles at their origin may be interfered with, giving rise to limited movement of the eyeball and anesthesia of the forehead and scalp. There is no papillitis, the eyeballs do not pulsate, nor are they invaded by the growth. The close of the disease leaves the eyes as perfect as before.

He reports two cases, in one of which the growths continued to increase for six months, and then under increasing doses of potassium iodide and mercury slowly diminished, until a year later the orbits were again normal. In the other case the contents of the orbit were removed for a rapidly growing tumor situated in the region of the lachrymal gland, and supposed, until examined microscopically, to be sarcomatous.—*The Lancet*, December 11, 1897.

Retinal and Optic Nerve Lesions Associated with Gout.—C. S. BULL (New York) finds these to be: Changes in the walls of the bloodvessels of the retina, choroid, and optic nerve, including arteries, capillaries, and veins. Retinitis of a peculiarly localized character, confined to the posterior zone of the fundus, with or without hemorrhages in the retina and vitreous, and characterized by a peculiar yellowish exudation, occurring in clearly defined patches. Optic neuritis, generally with, but sometimes without, an accompanying retinitis. The changes in the fundus are always bilateral, though rarely symmetrical in the two eyes. The lesion may begin simultaneously in the two eyes, but this is by no means always the case. The degenerative changes in the walls of the bloodvessels, both arteries and veins, are at first very minute and often overlooked. They must be carefully searched for, as they begin in the intima.

The general angio-sclerosis and the patchy exudation in the retina cause marked impairment of central vision, but little impairment of the peripheral

vision, and the disease never ends in blindness. The loss of central vision is always progressive up to a certain point. Improvement of the vision, after the retinal disease is established, cannot be expected, though in favorable cases the existing vision may be maintained.

Hemorrhages into the retina are rare except in the comparatively early stages of the disease. When the vessels lose their elasticity by reason of the increase in the thickness of their walls, due to the deposits, they become stronger and more rigid, and hemorrhages are no longer to be feared.

The most marked feature in the ophthalmoscopic picture is the development of the angio-sclerosis in the vessels of the retina. This condition is confirmed by the microscope, and is seen to extend to the vessels of the optic nerve and choroid.

Another almost equally marked symptom is the peculiar yellowish granular exudation in the retina, located by the ophthalmoscope around the posterior pole of the eye, and generally leaving the macula intact until late in the course of the disease. This exudation is shown by the microscope to be mainly in the nerve-fibre layer, though found in all the layers except that of the rods and cones.

The changes in the optic nerves seem generally to be intraocular, but have been traced occasionally for some distance back of the eyeball.—*Transactions of the Fourth Congress of American Physicians and Surgeons, 1897, p. 4.*

Positive Aberration Due to Flattening of the Cornea.—DR. AXENFELD (Marburg) reports the case of a girl, aged fourteen years, whose eyes had been inflamed in childhood, who presented in one eye hyperopia of 5 D. in an area at the centre of the pupil about 5 mm. in diameter; while at the periphery of the pupil, moderately dilated, without a mydriatic, she had myopia of 8 D.; and the cause of this great difference in refraction was for the most part in the cornea.

This anomaly of refraction was confined to the right eye. Between the hyperopic centre and the myopic margin was a zone approximately emmetropic. Her vision was 6/XVIII without any lens, the same with -7 D., and slightly better with +5 D. The reflection from the cornea of parallel black and white bands, instead of being narrowest at the centre of the cornea, as is usual in normal eyes, was much broadened in this region.—*Archives of Ophthalmology, October, 1897.*

[Axenfeld, in place of the term "Positive aberration," employs the clumsy phrases "Corneal curvature the opposite of kerato-conus; corrigible peripheral myopia, and corrigible central hyperopia in the same eye." He urges that such cases should be removed from the group of irregular astigmatism and studied separately.

The editor, in a paper on the "Measurement of Refraction by the Shadow-test, or Retinoscopy," published in this JOURNAL April, 1885, called attention to "a bright circle at the margin of the pupil, with a fainter central area, which indicates curvature of the crystalline lens, greater toward the margin than near the centre of the pupil."

And in 1887, in a paper on "Symmetrical Aberration of the Eye," read before the American Ophthalmological Society, and published in its *Transactions*, he discussed at length this anomaly of refraction. This latter paper

began thus: "From among the various defects of the dioptric media grouped by Donders under the one name, 'normal irregular astigmatism,' it seems of practical importance to isolate and habitually study alone the defect, or factor of defect, to which attention is here directed." The particular defect present in Axenfeld's case, resembling spherical aberration, was designated as Positive Aberration.

Aberration of this kind is present in the great majority of eyes, but is rarely of such high degree, and almost always depends upon the increased curvature of the periphery of the crystalline lens, rather than a flattening of the centre of the cornea. As the shadow-test comes to be more generally practised more of these cases are noticed. The careful study of them is likely to throw important light on the process of change in the refraction of the eye and the factors that produce it.]

Etiology of Dacryocystitis.—J. W. H. EYRE (London), from a study of the subject made in the bacteriological laboratory of Guy's Hospital, arrives at views of the etiology and pathology of this condition quite opposed to those commonly held, which regard the dacryocystitis as secondary to obstruction of the lachrymal passages. He admits that stricture of the nasal duct, when present, forms a very obvious predisposing cause of dacryocystitis; but is adverse to admitting its presence in all or even many of these cases. He regards stricture of the duct as a result of a long-continued supuration of the sac rather than a cause.

The steps by which it is brought about, he believes, are: 1. Invasion of the conjunctival sac by the streptococcus pyogenes longus, resulting in an attack of acute conjunctivitis. 2. Flushing of the conjunctival sac by lachrymal secretion and the washing of the streptococcus through the canaliculi into the lachrymal sac by the stream of tears. 3. Excessive secretion of mucus and exudation of leucocytes into the interior of the sac in the endeavor to remove the intruders. 4. Invasion of the mucous membrane lining the interior of the sac by the streptococcus, the appearance of the organism in the submucosa and finally in the cellular tissue surrounding the sac, and the consequent formation of pus in those situations to which it has gained access.—*Ophthalmic Record*, November, 1897.

Rapid Changes in Refraction in Glycosuria.—S. D. RISLEY (Philadelphia) reports two cases in which very important changes in the refraction were associated with variation in the amount of sugar secreted in the urine.

In one case of rapid improvement in the general condition, the sugar, which had been very abundant, entirely disappeared. The patient, aged forty-nine years, then found she could no longer read or see distant objects clearly with her glasses, + 2.75 D., although she had done so until within a few days. Under a mydriatic she was found to have full vision with + 5.0 + 1.25 cyl. and + 6.0 + 0.75 cyl. Ten days later, the glycosuria having returned, she was found to require lenses of 3 and 3.50 D. sph., with the above cylinders; and fifteen days after this she obtained full vision only with sphericals reduced to 1.25 and 1.50 D. There was no opacity of the lens.

The other patient, aged seventy-four years, had been carefully fitted with glasses. But six months later, his condition being improved in all other

respects, he was surprised to find that he could not see as well. On measurement he was found to require a convex lens 1 D. stronger for the right eye, and 0.75 D. stronger for the left. Within a month, however, the amount of urine and sugar having again increased, he was found to again require the former glasses.

Risley considers it probable that in these cases the change in the density of the tissue-fluids, suggested by the varying amount of sugar secreted with the urine, was sufficient to disturb the physiological relation of osmosis in the lens, and by this means cause the observed changes in the refraction of the eye.—*Trans. of the Amer. Ophthal. Soc.*, 1897, p. 121.

[Cases of diabetes giving the history of rapid changes in refraction have been encountered; but we do not know that any carefully observed case of such great and rapid change has been previously reported.—ED.]

Reid's Portable Ophthalmometer.—J. HINSHELWOOD (Glasgow) calls attention to the practical advantages of this instrument, which, although it was the subject, on the part of its inventor, Thomas Reid, of a communication to the Royal Society, five years ago, has not been so widely used as it deserves. In general arrangement it resembles other ophthalmometers. The doubling of the image is accomplished by a double prism, as in Javal's instrument. The object is an illuminated area of ground glass the size of which is controlled by an iris diaphragm. The curvature of the cornea is measured by the size of object necessary to bring the two reflected images of it in contact. When the cornea is spherical these images are circular. When it is astigmatic they are ellipses. The direction of the longer and shorter axes of the ellipses indicate the meridians of astigmatism.

The instrument is four inches long and weighs six ounces, occupying not much more space than an ordinary pocket ophthalmoscope. It can be used anywhere, with a patient standing, sitting, or lying down. A very moderate amount of light furnishes a satisfactory illumination. Both regular and irregular astigmatism are duly recognizable with it, and in the measurement of the former a high degree of precision (0.5 to 0.25 D.) can be readily attained.

The difficulties about using it are to hold the instrument steady and to focus it. The first is overcome by placing the little finger of the hand holding it against the patient's brow, and the second by gradually bringing the instrument toward the eye until the images are seen clearly.—*Ophthalmic Review*, November, 1897.

[The editor's trial of this instrument has satisfied him that it is an ophthalmometer of practical value and accuracy. Where a large instrument can be mounted to the best advantage with a proper illumination, the Javal ophthalmometer is probably a little better; but under other conditions Reid's portable instrument is more convenient and satisfactory.]

Ocular Crises in Tabes.—PEL (Amsterdam) reports recurring attacks of severe pain in both eyes accompanied by intense lachrymation, photophobia, and spasm of the orbicularis, lasting two or three hours, in a subject affected with tabes dorsalis. He denominates them ocular crises analogous to the gastric, intestinal, renal, and other crises known to occur in this disease.

But he claims that this is the first instance in which a tabetic crisis has been observed to involve a higher cerebral nerve—*i. e.*, the fifth. The crises thus far described have occurred only in organs rich in vagi and sympathetic fibres. If the varied endowments of the fifth nerve be considered, with its secretory, sensory, motor, and vasomotor fibres, it does not seem strange that this cerebral nerve should be affected with tabetic crises.—*Berliner klinische Wochenschrift*, 1898, No. 2.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Foreign Bodies in the Nasal Passages.—DR. EDWARD F. PARKER exhibited to the South Carolina Medical Association (*Journal American Medical Association*, October 9, 1897) an accessory tooth which he extracted from the left nasal passage of an adult, twenty-nine years of age, who had consulted him for a chronic discharge from the nose. The tooth, evidently a canine, had been firmly embedded about midway between the anterior and posterior openings in the mucous membrane covering the bony floor formed by the hard palate. Its removal was followed by rapid amelioration of the symptoms complained of.

He also reported an instance of rhinolith removed from the left nasal passage of a lady, forty-five years of age, who for twenty years had suffered from a fetid discharge from the left side of the nose and chronic stricture of the lachrymal duct. A large, rough, irregular stone was found firmly lodged in an old suppurating ulcer just at the lower end of the tear-duct. As far as could be determined its exciting cause had been a piece of necrosed bone from a diseased tooth extracted years before. The annoying discharge ceased shortly after the removal of the foreign body.

Rare Fractures of the Nose.—DR. J. GARELL (*Annales des Maladies de L'Oreille, du Larynx, du Nez et du Pharynx*, October, 1897) reports a case of fracture of the inferior turbinated bone in a child, two years of age, due to a blow from a ball. There was no bleeding, and little attention was paid to it; but purulent and fetid secretion commenced in two weeks after the accident, and continued for two years, when the mother found a foreign body presenting at the orifice of the right side of the nose, which, when removed the next day, turned out to be the necrosed inferior turbinated bone.

Dr. Garel also summarizes a case reported by FREYTAG (*Monats. f. Ohren.*, March, 1896) which he states is the only other case on record. In the latter there was a fracture of the ascending superior maxilla; in addition the symptoms were far more acute, and there was deformity.

Adeno-carcinoma of the Nose, and Papillary Œdematous Nasal Polypi and their Relation to Adenomata.—At the last meeting of the American Laryngological Association DR. F. E. HOPKINS and DR. G. A. LELAND, of Boston, each reported (*New York Medical Journal*, 1897, No. 989) a case of adeno-carcinoma of the nose, the first in a male eighty-three years of age, the second in a frail woman of fifty years.

DR. JONATHAN WRIGHT, of Brooklyn, read a paper upon "Papillary Œdematous Nasal Polypi and their Relation to Adenomata."

These three papers should be studied together, especially that by Dr. Wright, which is illustrated with a number of pictures from sections under the microscope.

It appears from this study that the malignant growths are sometimes a distinct evolution of benignant growths, and that some cases are apparently hurried into malignancy by violent manipulations. The long conceived idea that the ordinary mucous polyp is a true myxoma must be abandoned, as it is positively shown that it is an œdematous growth, true myxoma being so rare that in the opinion of Dr. Wright it is never found in the nose. The œdematous polyp is usually the result of chronic inflammation. In some cases changes take place through epithelial proliferation and otherwise, which give these growths the papillary character. This has sometimes caused them to be mistaken for epitheliomas. An effusion of serum into the tissues and proliferation of the fibrous tissue produce an œdematous mucous polyp, while subsequent proliferation of the epithelium upon the surface and in the glandular growths transforms them into œdematous and papillary growths. These growths, in their turn, have a tendency to transformation into sarcoma or carcinoma.

Radical treatment rarely saves life, and sometimes fails even as a palliative.

Serum-therapy in Ozæna.—Some subjects of this disease, treated for diphtheria with anti-diphtheritic serum, have experienced great benefit to their old disease. Attempts have been made from time to time to introduce these injections as the special treatment for fetid chronic internal rhinitis.

In the Nov. number of the *Annales des Maladies de L'Oreille, du Larynx, etc.*, 1897, DR. E. LOMBARD presents an original memoir on this subject the result of some experiments made in the clinic of Dr. Gouguenheim. No other treatment was employed at the same time. The injections were made in the abdominal walls. General constitutional results were produced, such as erythema, pains in the joints, local arthritis, etc., as is not unusual in the employment of the serum for other purposes. Immediate results upon the ozæna are said to have been remarkable in general. The fetor becomes diminished, and even disappears completely. This effect appears to be a constant one. The crusts continue to be formed, and though they may become less abundant, they do not diminish rapidly. These beneficial results were maintained for a number of months after the treatment had been discontinued. Whether they will be permanent or not remains to be seen.

[On the whole, considering the constitutional injuries to which the patient is liable, we do not think that this method of treatment is to be commended, inasmuch as equally good results are obtainable by much milder methods, and without risk of constitutional contamination.]

Gumma of the Septum.—DR. E. LARUE VANSANT read a paper at a late meeting of the Section on Otology and Laryngology of the College of Physicians of Philadelphia on "Gumma of the Septum, with a Report of One Case."

Staphylorrhaphy.—Special successful results have been demonstrated by M. LENGIER to the Belgian Society of Surgery (*Revue Internationale de Rhinologie, Otologie et Laryngologie*, August, 1897) by performing the palato-plastic operation in two sittings after Baizeau's method, and final staphylorrhaphy for congenital fissure of the hard and soft palate.

At the first sitting the operation is performed only upon the anterior three-fourths of the palate, avoiding the posterior palatine artery, its principal nourishing vessel. The second operation is not undertaken until the patients have recovered their strength, and the flaps have become self-nourished and capable of intimate union.

The second sitting causes more bleeding, on account of the section or rupture of the posterior palatine artery, but this hemorrhage is easily arrested by compression with sponges firmly secured to a holder.

In performing this palato-plastic operation in two sittings no lesions of the palatine flaps have been observed. The results have been excellent. The staphylorrhaphy is performed in one sitting, two movable bridges being secured by lateral detachments. For details the original article must be consulted.

Urticaria of the Pharynx.—At a late meeting of the Section on Otology and Laryngology of the College of Physicians of Philadelphia DR. JOHN MADISON TAYLOR reported a case of urticaria of the pharynx producing grave œdema of the glottis.

OTOLOGY.

UNDER THE CHARGE OF

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Cylindroma of the Concha.—HAUG reports the occurrence of cylindroma in the concha of a woman, aged sixty-five years. The tumor, in the course of twelve years, grew from the size of a cherry to that of a pigeon's-egg. Extirpation of the tumor was accomplished by means of scissors and knife. Entire recovery ensued in seventeen days. Haug claims that this is the first instance in which a cylindroma has been reported, with histological proof, as originating in the ear.—*Archiv für Ohrenheilkunde*, vol. xliii.

Ultimate Results of Operations on the Mastoid.—The above-named subject was discussed at the last meeting of the British Medical Association, held in Montreal.

DR. BULLER, of Montreal, in opening the discussion, considered the path-

ological conditions necessitating operation on the mastoid under two headings:

1. "Those conditions in which the bone is inflamed and softened, with or without purulent infiltration, or mere circumscribed collections of pus, but in which there is no actual caries of the bony structure.

"In this class, if decomposition of the inflammatory exudation or of the tissues involved has not taken place, there is no fetid or ichorous pus. As a distinct type of mastoid disease, these cases are met during or shortly after acute purulent disease of the middle-ear, and more often in adults than in children."

2. In the second class are those cases "in which actual death of the bone has occurred more or less extensively, either in the form of caries or necrosis, or both. This class is found in the more chronic forms of middle-ear suppuration, and more often in children than in adults, though by no means rarely in the latter." In these cases the carious bone may not be confined to the mastoid, but often involves other parts of the temporal bone adjacent to the mastoid or tympanum. Dr. Buller's experience is that operations in the first class have been invariably favorable, "when the bone was opened before the occurrence of intracranial complications." All such recover in a few weeks after operation, "even to the extent of regaining perfect or almost perfect hearing," and recovery is permanent.

"The results may be very different when there has been extensive caries of the bone, or, perhaps, only a limited caries in an inaccessible position." In such cases the operator cannot follow definite rules; "he must follow, trace out, and remove diseased bone and inflammatory débris as he goes along, only staying his hand when he has removed all diseased bone, etc., that can be reached, or when, in his judgment, prudence dictates that he should go no further." Puncture of the lateral sinus is not to be dreaded especially; "the facial nerve is the structure which gives the operator the greatest anxiety." Of course, the more diseased tissue that is found and removed, the longer time will it take for the wound to heal and the ear to cease discharging, while restoration of hearing in chronic cases will not be great. Although most of the chronic cases recover—*i. e.*, do not die—"a certain proportion succumb to intracranial complications." The cases slowest to heal are those in which the diathesis is obviously strumous; but even here the prognosis is not without hope, if the treatment—both general and local—be careful and prolonged. The gravity and importance of mastoid disease cannot be too fully appreciated. "We never know exactly what we are going to meet with until we have begun the operation, and we never meet with two cases that are exactly alike in every detail. For individuality, mastoid disease bears the palm against all surgical conditions; hence the increasing respect it commands from all experienced otologists." Dr. Buller also reported a case of mastoid disease with sinus-thrombosis, evacuation of the sinus and ligation of the internal jugular vein, followed by recovery.

DR. ALBERT H. BUCK, of New York, followed Dr. Buller in the discussion, and, like him, limited his remarks "to those cases in which the disease is more or less strictly confined to the mastoid region and middle-ear." Such cases may be divided into acute and chronic. "In cases belonging to the former group the operation is almost always successful; and if, in course of

time, it be found that operative interference has not arrested or entirely cured the disease, the inference is warranted that our methods of procedure have been in some respects defective. In the chronic cases an equally favorable result may be expected from a thorough removal of all bone tissue that is diseased. There, however, the interference required is apt to be much more extensive than in the acute cases. It is not always an easy matter to decide, from inspection and from the degree of firmness which the bone manifests, whether we may safely allow it to remain. A high degree of vascularity, as shown by the color and by the persistent and copious character of the bleeding from the cut surface, and especially any evidences of an established stasis in some of the vessels, should be accepted as indications that the bone so involved is not likely to return to a condition of health, and consequently should be removed. The mere presence of granulation tissue in the pneumatic cells (without any recognizable amount of pus) is also a good indication that the bony framework in their vicinity should be entirely cut away. The grosser indications of disease will scarcely escape detection, provided the field of operation is made large enough to bring all the suspected parts into view."

MR. HUGH E. JONES, of Liverpool, Eng., in continuing the discussion, confined his remarks to the risks and complications of the operation on the mastoid. His experience is based upon about thirty cases, in which the radical operation on the mastoid and ear was performed chiefly for relief of chronic suppuration of the middle-ear. No fatal result has followed the operative interference, but facial paralysis has followed in four cases, twice transient and twice permanent. In order to avoid injuring the facial canal, the operator must see well into the cavity he is making in the bone. The difficulties in the way of this are bleeding and the unmanageableness of the partly detached auricle. Mr. Jones overcomes both of these difficulties by passing a strip of linen, ten inches long and two or three inches wide, at one end and tapering at the other, narrow end first, through the severed inner end of the auditory canal, out through the meatus, and then drawing the auricle-flap forward. This manœuvre not only holds the auricle out of the way, but the pressure of the strip arrests bleeding. "Giddiness and vomiting never lasted more than twenty-four hours. . . . Tinnitus has not been complained of as a result of the operation. . . . There has been no increase of the deafness; but, in the majority of the cases, the hearing was definitely, and in some cases greatly improved."

In five cases Mr. Jones operated chiefly to relieve pain; "they have all been very much freer, and some entirely free from pain, since the operation." While the operation has not always entirely and permanently checked the purulent discharge from the ear, in those cases in which some discharge has continued the conditions have improved, the patients are more comfortable, and the parts operated upon are more readily reached by treatment. Comparing the cases operated upon with concurrent cases of a similar nature in which operation has been declined, "the comparison has nearly always resulted in favor of the cases which have been operated upon."

DR. C. J. BLAKE, of Boston, limited his remarks to the selection of an operation and the bacteriology of the cases. Thirty-six cases in three months form the basis of his communication. His cases are classified as,

"First, cases of acute inflammation of the mastoid, originating in acute inflammation of the middle-ear, confined to the contents of the mastoid process, and in which thorough evacuation of the mastoid contents and establishment of free communication with the middle-ear through the mastoid antrum, followed by *filling the operative cavity with blood*, and closure of the external wound, resulted in what was practically a healing by first intention."

"Second, cases of mastoid disease in which the mastoid cortex had become more or less involved in the destructive process, and the operative procedure consisted not only in the evacuation of the mastoid contents, but also in the removal of portions of the surrounding wall without attempt at primary healing."

"Third, cases in which, in addition to the disease already mentioned, there was implication of structures surrounding the mastoid process, and invasion either of the cranial cavity or extrusion of the suppurative mastoid contents posteriorly toward the occiput or downward into the muscles of the neck."

Dr. Blake finds that, as a rule, "the narrow, small, and pointed mastoid has a deep groove for the sinus, and a consequently small operative triangle; while, on the contrary, the broad, blunt, and rounded mastoid process is deeper posteriorly, and has an operative triangle of correspondingly greater size."

The attempt at primary healing, described above, was made in seventeen cases, eleven acute and six chronic. It failed in all the chronic cases, but was successful in five of the eleven acute cases. "No possible harm can result from it, since, if the blood-clot breaks down, the sutures can be easily removed and the wound allowed to heal by granulation." In eighteen cases, ten acute and eight chronic, in which it was not necessary to remove any part of the mastoid cortex, no attempt at primary healing was made. Of the acute cases all did well except one, which required a secondary operation; the other acute cases (eight) recovered promptly in from six to eight weeks after operation, while one (a diabetic) was still under treatment three months after operation. In nine cases (six acute and three chronic), in addition to thorough evacuation of the mastoid, portions of the diseased cortex were removed and the affected dura exposed.

Of the acute cases one died of septic cerebro-spinal meningitis ten days after the operation, one of intercurrent measles, one was discharged well in two weeks, one at the end of five weeks, and two were convalescent in the out-patient department at the time of Blake's remarks. Three chronic cases were under treatment in the out-patient department slowly improving. In all these nine cases pus was found in contact with the dura; in five the sinus-wall was exposed in the operation, and in two accidentally opened, with resultant hemorrhage. In three acute cases pus was found between the dura and the posterior superior angle of the mastoid. In two of these cases the sinus was exposed for an inch by the operation, and in the third "the inner wall and the tip were removed from both mastoids and the pus followed back into the jugular fossa and the contiguous bony wall thoroughly curetted, with good results." In one case, acute, a small brain- abscess was found over the antrum. After operation rapid recovery ensued. In a chronic case, a child aged five years, a cerebellar abscess was found

and evacuated, and, notwithstanding marked cerebral hernia, appeared to be making a speedy recovery. In the cases of infectious cerebro-spinal meningitis, referred to above, the diagnosis was confirmed by lumbar punctures, performed by Dr. J. J. Putnam.

In review of Blake's cases it may be said that "all of the cases of acute mastoid disease did well in the sense of rapid recovery, with two exceptions, and that the same may be said of 50 per cent. of the chronic cases. The other 50 per cent. of the chronic cases were either very slow in healing, or required secondary operations."

The streptococcus was found pure in twelve cases; staphylococcus in five cases; diplococcus in six cases; streptococcus and diplococcus, five cases; streptococcus and bacillus *fœtidus*, three cases; staphylococcus and bacillus *pyocyaneus*, one case; streptococcus and diplococcus (*staphylococcus?*), one case; streptococcus, staphylococcus, and diplococcus, two cases.

As a rule, the same germ, obtained by paracentesis, was found later in the mastoid. Blood-counts showed that whenever pus was in contact with the dura, leucocytosis was found, while with the mastoid inner cortex intact, even though the mastoid cavity was filled with pus, no leucocytosis was observed.

"In conclusion, it may be said that this series of cases emphasizes the conclusions drawn from previous experience that all diseased bone, cortical or otherwise, should be removed and the pus followed to its ultimate extension when possible, after thorough surgical cleansing by the operative procedure; healing by first intention should be favored, and that in case of hemorrhage from the lateral sinus or from meningeal arteries, by rapidly enlarging the opening in the bony wall of the cranial cavity, the normal brain pressure may be utilized to plug the vessels, and the operation continued without interruption."—*British Medical Journal*, No. 1926, 1897.

DERMATOLOGY.

UNDER THE CHARGE OF

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Treatment of Scleroderma.—A. PHILLIPSON (*Deutsche med. Wochenschrift*, 1897, No. 33) reports two cases of the diffuse form of this disease (one being a moderately severe and the other a severe manifestation) with salol. The first case was cured after eighteen months' treatment; the second was distinctly improved after five and a half months. The dose was from 30 to 45 grains daily, the writer observing that this drug may be taken for a year continuously without disturbing the stomach. Light gymnastics are recommended for the stiffness of muscles, tendons, and joints.

Trichorrhæxis Nodosa Barbæ.—SPIEGLER'S (*Archiv für Dermatologie und Syphilis*, Bd. xli., Heft 1) conclusions concerning this affection are as follows:

Trichorrhæxis nodosa barbæ is a parasitic affection produced by a bacillus most probably identical with that described by Hodara. This bacillus is found constantly in the diseased hairs as heaps of cocci, as well as rods up to $12\ \mu$ long; it is found not only in the hairs themselves, but in the sub-epidermal part of the hairs and in the cells of the wall of the follicle. It may be cultivated upon the usual media. Sound hairs do not show such colonies, nor can the bacillus be cultivated from such hairs. Other micro-organisms, so far as known, cannot produce trichorrhæxis nodosa. Since the aim of rational therapy is to eliminate the cause of disease, regular shaving, epilation, and the application of parasiticide ointments are necessary.

Eruptions of Sudoral Origin.—PERRIN (*Annales de Dermatologie et de Syphiligraphie*, 1897, No. 11) calls attention to the various eruptions occurring during the heat of summer, associated with abundant perspiration. When the heat of summer is excessive a great number of inflammations of the skin, having a furunculous aspect, are observed. These are coincident with sudamina, miliaria, sudoral exanthemata, and dysidrosis, with a degree of frequency more or less marked, according to the heat. It is in infants that these eruptions are most frequent, and women are more predisposed to them than men. They are localized in those regions where the skin is delicate and the secretion of sweat most active, the places of predilection being the face, the scalp, the neck, the upper part of the trunk, the dorso-lumbar region, and the flexor surface of the upper extremities. The eruption consists of more or less voluminous nodes, frequently in great numbers, with or without the production of pus, tubercles, and papulo-pustules. Left to themselves, not all these lesions suppurate; some of them may become indurated and finally disappear. Cure is rapid if treatment is instituted and the patient is placed in proper hygienic conditions. These eruptions seem, like sudamina and miliaria, to be consecutive to the sudoral flux. Under the influence of this and the congestion of the skin, staphylococci find a soil suitable for their growth and acquire great virulence, causing adenitis or periadenitis. They penetrate the sudoriparous glands and the pilo-sebaceous follicles.

Disseminated Gangrene of the Skin due to Iodide of Potassium.—AUDRY (*Annales de Dermatologie et de Syphiligraphie*, 1897, No. 11) reports the following case: A woman, aged forty-seven years, after an attack of seborrhœic eczema of the face, suffered from extreme nervousness, and upon the advice of a pharmacist, she took iodide of potassium internally, which produced a characteristic bullous eruption. Suppression of the drug was followed by a speedy cure. Two years later she again took a preparation containing iodide of potassium for a period of six months, at the end of which time she presented herself, with large ulcerations of the skin in the left axilla, beneath the left breast, in the bend of the left elbow, on the scalp, in the perineo-crural and in the lumbar regions, the most extensive

lesions being in the two last-named situations. The ulcers were sharp-cut, with slightly elevated borders. The mucous membranes were unaffected. The urine contained neither sugar nor albumin, but the patient's general health was bad.

Treatment of Lupus by Injections of Calomel.—DUBOIS-HAVENITH (*Annales de Dermatologie et de Syphiligraphie*, 1897, No. 12), at a séance of the Société Française de Dermatologie et de Syphiligraphie, reported fourteen cases of lupus treated by one of his former pupils, Dr. Asselbergs, by injections of calomel. The effect of these injections in almost all the cases was decided, being most marked when first employed, but growing weaker as the number was increased. A complete cure was obtained in several cases; in others a marked improvement was manifest. This treatment seems especially useful in old tuberculo-ulcerative cases with deep infiltration.

Pityriasis Rosea.—KROMAYER (*Dermatologische Zeitschrift*, Bd. iv., Heft 6) reports a case of pityriasis rosea produced by the irritation of new stockings. Fourteen days after a young woman had exchanged woollen stockings for new cotton ones a macular eruption resembling pityriasis rosea exactly appeared upon the legs up to the knees, covering those parts in contact with the stockings. The reporter concludes that the mechanical or chemical irritation of new underwear is one of the etiological factors concerned in the production of this disease.

Hydroa Estivale, with Hæmatoporphyrin in the Urine.—MCCALL ANDERSON (*British Journal of Dermatology*, January, 1898) reports two cases of hydroa estivale occurring in brothers, in which the cutaneous eruption was complicated with the appearance in the urine of a Burgundy-colored pigment free from proteids and iron, allied to uro-hæmatoporphyrin. There was an eruption on the face, ears, and hands, which usually began in early summer and disappeared on the approach of winter. The disease began with sensations of itching and burning in one of the localities mentioned. In ten or twelve hours this was followed by the formation of blisters from a pea to a crown-piece in size. The rupture of these lesions was followed by cicatrization and contraction, and as a result the fingers became so stiff that the patient was unable to completely close his hands. The urine was of a light Burgundy-red color during the attacks, becoming normal in the intervals in the first case, but never resuming its normal color in the second.

Eosinophilous Cells in the Blood in Syphilis and Skin Diseases.—PETER (*Dermatologische Zeitschrift*, Bd. iv., Heft 6), from his investigations, concludes that in no form and in no stage of syphilis, even in extensive fresh eruptions, is there an increase of eosinophilous cells in the blood, and that the statements concerning their occurrence in skin diseases should be essentially modified. There are only a few diseases of the skin in which this increase frequently appears, as certain eczemas and forms of pemphigus. A constant increase of eosinophilous cells is found only in prurigo, and here it is demonstrable with the first appearance of the eruption in childhood. In the concurrence of skin diseases and eosinophilia it is by no means to be

accepted that the skin affection is primary; on the contrary, it should rather be supposed that both are the results of the same cause. What circumstances lead to the constant increase of eosinophilous cells in prurigo is not yet clear.

Granuloma Trichophyticum Majocchi.—PINI (*Archiv für Dermatologie und Syphilis*, Bd. xlii., Heft 1) briefly reviews the literature of this unusual form of trichophytosis, and reports three new cases, from the study of which he draws the following conclusions: There exists a clinical complication of herpes tonsurans which differs from kerion and sycosis. It consists of round or flat nodules from a rose-red to a cyanotic hue, scattered about or, more frequently, arranged in chains, developing very slowly, inclined to softening, but never ending in suppuration. The histological structure of these nodules is different from those formed through inflammatory folliculitis, and is like that of the granulomata. The etiological factor is the trichophyton which occurs within the granuloma in the form of hyphæ and spores.

Salicin in the Treatment of Lupus Erythematosus.—CROCKER (*British Journal of Dermatology*, January, 1898), at a meeting of the Dermatological Society of London, showed two cases of lupus erythematosus in which salicin had been administered in fifteen-grain doses, three times a day, with excellent result, a cure occurring in one and great improvement in the other. The external treatment consisted in the application of calamine lotion, which was painted on twice a day. In the case in which a cure had resulted, the treatment had been continued about five months; the second case had been under treatment for a shorter time. It was not claimed that salicin would cure every case, but that a good many were cured or improved by this form of treatment.

OBSTETRICS.

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The Elimination of Germs through the Milk-glands.—In the *Berliner klinische Wochenschrift*, 1897, No. 45, BACH and WELIMINSKY report experiments undertaken to show the results of the presence of infectious germs upon the milk-glands.

They selected guinea-pigs for their researches, and took every precaution to make the glands and nipples thoroughly aseptic. They then injected cultures of anthrax, which resulted fatally to the animals, but which did not produce infection of the milk.

The opposite, however, was the result when intravenous injections of pus-

forming bacteria were made. In from five to eight hours after injection these organisms were found in the milk.

In the case of two women, suffering from puerperal septic infection, streptococci were found in the blood, but not in the milk.

The writers conclude from their experiments that infective germs which gain access to the milk do so simply by circulating through the glands in the blood stream, and that to enter the milk they must pass through the glandular substance of the breast through some injury to the gland substance.

The question whether the milk of the infected animal is fit to use must be settled for each case by a careful study of the individual patient.

A Combined Intra- and Extra-uterine Pregnancy at Term.—In the *American Journal of Obstetrics*, December, 1897, ROYSTER reports the case of a colored woman, aged thirty-four years, who had had six children in easy labors. A negro midwife delivered the patient forty-eight hours before of a living child in the natural way, but sent for the doctor because a second child was retained which could not be expelled.

On examination the uterus was empty and unruptured, while a full-term fetus was lying transversely inside the abdominal cavity. A diagnosis of abdominal pregnancy at term was made, and operation advised. This was refused.

Some time afterward, when the child had died and the patient was threatened with sepsis, consent to operation was obtained. On investigating the history it was found that rupture of the sac had occurred. On abdominal section, a dirty yellowish fluid escaped from the abdomen, the fetus was delivered, and the cord tied and cut. The placenta was adherent to the abdominal wall and the left side of the pelvic brim. The gestation sac was entirely outside the peritoneum, and the general cavity of the abdomen had only been opened for two inches. The placenta was loosened by dissection and two silk ligatures placed upon vascular adhesions. There was little bleeding. The sac was washed out with hot salt solution, sponged dry, and the abdominal wound closed with silkworm-gut sutures, strips of gauze being used for drainage at the lower end of the incision. The cavity drained for several weeks, the patient finally making a good recovery. The ectopic fetus was fully developed, weighing four and one-quarter pounds. The placenta weighed two pounds.

Spurious Abortion, with an Account of Three Cases.—In the *British Medical Journal*, 1897, No. 1925, EDEN contributes a paper upon the above subject. His case was as follows:

The patient was a multipara who had missed her menstruation for eleven weeks. After one day's hemorrhage a fleshy mass was expelled, which was at first thought to be an abortion. While menstruation was absent there had been morning sickness, but not as severe as in previous pregnancies. The patient made a complete recovery.

On examining the mass which had been expelled, it was found to be a triangular cast of the uterus, measuring four inches by three and three-quarters inches, and varying in thickness from 3 to 8 mm. The outer surface was rough and uneven; the inner dull, glistening, and thrown into numerous longitu-

dinal folds. There was interstitial hemorrhage at the apex of the cast. Thorough microscopical examination could find nothing but decidua. There was no trace of placenta or chorion. This is what is termed "Spurious Abortion," and is defined as the development within the uterus, in the absence of gestation, of a membrane having the essential characters of the decidua of pregnancy and accompanied by signs of early pregnancy. Its separation and expulsion from the uterus with hemorrhage simulate abortion.

There are two explanations for such a condition. One is that an ovum was actually fertilized, but perished at a very early period, while the decidua continued to grow. The second theory is that some other stimulus may cause the formation of decidua and prevent menstruation. The first is the more probable explanation.

In addition to his own, Eden quotes Griffith's case, and also that reported by Dakin.

Griffith's patient had never been previously pregnant. She suffered from symptoms of early gestation. A cast of the uterus was expelled, composed of decidua. The womb was somewhat enlarged.

In Dakin's case the patient had borne a stillborn child eight months before the spurious abortion. At this time she was treated for subinvolution, and recovered. After a slight interruption of menstruation she expelled a uterine cast. There was a lump on the right side of the abdomen. The uterus was enlarged and the patient was thought to have an ectopic gestation. The abdomen was opened, when the lump was found to be an ovarian cyst, which was removed.

In this case pregnancy can be positively excluded, yet the patient had a brief, definite period of amenorrhœa and marked enlargement of the uterus with the discharge of a cast.

A Case of Strangulation of a Full-term Child, with Tympany of the Uterus and Emptying of an Echinococcus Sac through the Uterus.—In the *Monatschrift für Geburtshülfe und Gynäkologie*, 1897, Band vi., Heft 5, BONORDEN reports the case of a patient who had lost a child in her first labor through neglect, and who had been treated for a vesico-vaginal fistula.

The patient had a tumor on the left side of the uterus, which in her second confinement obstructed labor and which had to be punctured. It yielded a clear serous fluid. This labor terminated spontaneously. When the patient came under observation she was four months pregnant, and the cystic tumor was very plainly outlined. She declined operation until after the pregnancy should terminate. She finally came into labor, and puncture of the tumor was made with very slight results. The membranes ruptured and the child's heart-sounds ceased. Fluid was again taken from the tumor and the child was gradually expelled, the cord being tightly drawn around the neck. As the body of the child emerged, very foul gas escaped from the uterus. The patient had a rapid pulse, bleeding from the womb, elevation of temperature, with a foul discharge. The tumor ruptured into the uterus and discharged through the womb and vagina. Microscopic examination of its fluid showed it to be an echinococcus cyst. The patient made a tedious recovery under stimulating treatment and vaginal douches. There remained in the pelvis adhesions at the site of the tumor.

Total Inversion of the Uterus after Abortion.—In the *Centralblatt für Gynäkologie*, 1898, No. 3, SWITALSKI reports the following case: The patient was a multipara who aborted at five months, with severe hemorrhage. The placenta was retained for several hours. On admission to the hospital the patient was found an ill-nourished, anemic woman. The uterus was completely inverted, its mucous membrane excessively pale in color. Under chloroform anesthesia an effort was made to reinvert the uterus by manipulation. This procedure was unsuccessful, the anterior wall of the uterus being torn and the bladder stripped up from the womb. Küstner's operation was then performed. The posterior cul-de-sac was opened and a longitudinal incision made in the posterior wall of the uterus. This loosened the contraction ring, when the womb was readily reinverted. The posterior wall was then sutured, and the peritoneum also. The patient made an excellent recovery.

A piece of the womb was excised for examination, and its muscular tissue found in a degenerated condition. It was impossible to tell how the inversion had happened, although the thinness of the muscular tissue and the degeneration of the muscle-fibre must have contributed to the result. In this case the success of Küstner's operation was very pronounced.

The Absolute Indication for Cæsarean Section.—In the *Centralblatt für Gynäkologie*, 1898, No. 3, GUERARD draws attention to the measurement between the tuberosities of the ischia and its value as giving an indication for Cæsarean section. He was called to a patient in labor who had a kyphotic, funnel-shaped pelvis in which the distance between the tuberosities of the ischia was 4.7 cm. The pelvis was so much contracted that Cæsarean section was clearly indicated. The child was living and in good condition. The parents, however, absolutely refused to allow the operation. Accordingly, under protest, craniotomy was done. It was impossible to extract the head without removing the individual bones. The clavicles were then cut and the body of the child finally removed. The mother made a good recovery.

After her convalescence the transverse diameter of her pelvic outlet was measured by introducing a pelvimeter within the birth-canal, and the original measurement was found nearly correct. The case is reported as an example of successful embryotomy in a highly contracted pelvis.

Cæsarean Section, with Transverse Incision and Total Removal of Uterus because of Sepsis.—In the *Centralblatt für Gynäkologie*, 1898, No. 4, SIEDENTOPF reports the case of a patient brought to the Magdeburg clinic in labor twenty-four hours, and infected. The patient had a flat rhachitic pelvis, so small that a living child could not be delivered. The child was in fairly good condition, however, while the mother was jaundiced, had albumin in the urine, and had constitutional infection. After waiting a reasonable time for the head to engage, and finding no progress, the patient was anesthetized, the abdomen opened, and the uterus opened by a transverse incision across the fundus. The child was readily extracted, asphyxiated, and was resuscitated. The placenta was removed and the incision closed. The cervix was then brought together with forceps, and the upper portion of the abdominal incision sutured. The bladder was separated from the

uterus, the broad ligaments ligated and the uterus entirely removed. The operation was partially performed through the vagina. The patient made an excellent recovery.

As regards the extraction of the child, it was rapidly and successfully done without bleeding, and the incision readily closed. It was thought best, however, as the uterus was infected, to remove it.

Cæsarean Section After the Mother's Death.—DOHRN (*Centralblatt für Gynäkologie*, 1898, No. 4), in a paper upon this subject, urges that no operation should be performed before the twentieth week of fetal life. It is also a rule that not more than twenty minutes should elapse after the mother's death before the child is removed by Cæsarean operation.

The Treatment of Placenta Prævia.—In the *Glasgow Medical Journal*, January, 1898, JARDINE reports the case of a patient eight and a half months pregnant, who had a marginal placenta prævia. The membranes were ruptured and the uterus stimulated by friction. The patient delivered herself spontaneously, and made a good recovery.

Jardine has collected fifty-one cases in which various methods of treatment were employed. In one of these labor was induced for contracted pelvis, and De Ribes' bag was introduced as a dilator. The bag burst, and severe hemorrhage occurred. The child was immediately delivered, when it was found that the placenta had been attached low down. The patient died of shock.

In discussing treatment, Jardine urges that emptying of the uterus is the only reliable method. While the tampon is valuable in many cases, it occasionally converts an evident hemorrhage into a concealed bleeding.

Oophorectomy During Labor.—In the *Boston Medical and Surgical Journal*, 1897, No. 26, REYNOLDS reports the case of a patient in labor who had an ovarian tumor. The tumor was at the bottom of Douglas' fossa, and about the size of a seven-months head. The os was as large as a five-cent piece and could be reached with difficulty above the tumor. The patient was etherized, placed in the knee-chest position, and gentle taxis tried for ten minutes. This failed, and some hours later was again tried without result. The abdomen was opened, when large quantities of pus escaped. The tumor was firmly adherent to the bottom of Douglas' fossa and was necrotic. The tumor was tied off with catgut. The forceps was then applied through the vagina, but failed to deliver. As the fetal heart did not beat, the head was perforated and the child extracted. The intestines and abdomen were cleansed as well as possible, and salt solution poured into the abdomen, a capillary drain inserted, the wound hastily closed, and the patient put to bed with the foot of the bed raised. The patient made a gradual recovery, complicated by a transient infection of the uterus.

The forceps failed to extract because of a tight constriction-ring about the neck. As the abdomen was opened this could be seen. The head of the child was contained in the spherical lower part of the uterus, its body so bent by the contracting uterine muscles that its backbone lay almost transversely across the abdomen.

Reynolds believes that in such cases gentle taxis should first be tried, with the patient under ether. Should this be unsuccessful, it should be repeated after a few hours. Should failure occur the abdomen must be opened, the uterus incised, the fetus removed, and the tumor, if possible. Should unusually firm adhesions be present the removal of the tumor should be deferred. When the patient has been infected it would be better to remove the tumor and deliver the child through the vagina without opening the uterus.

Two Cases in which Porro's Operation was Performed for Pelvic Tumors Preventing Delivery.—ROBSON (*British Medical Journal*, No. 1921, 1897) reports the case of a suppurating ovarian cyst complicated with an abscess bounded by uterus, cyst, and intestines, in which he delivered the child by the Porro operation, followed by the gradual recovery of the mother. So soon as the child was delivered by uterine incision and the uterus was brought forward, a large abscess in the abdomen was opened, filled with offensive pus. The tumor and the womb were so adherent that both were amputated together, the abdomen washed out with hot boric solution, and a glass drainage-tube introduced to the bottom of the pelvic cavity. The patient's temperature immediately fell to normal and remained so. His other case was that of a myoma successfully operated upon in the same way.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

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Pollution and Self-purification of Rivers.—PROF. GUSTAV KEBREHL (*Archiv für Hygiene*, xxx. 32) has made, for more than a year, a daily bacteriological examination of the water of the Moldau, taken at three points: before and just after its entrance to the city of Prague, and where it leaves it. From the results obtained he finds that the number of bacteria occurring at any one point varies very widely, and, in general, that with rising water it increases, and with falling it diminishes. The variations are due to changes in the rate of flow, with consequent alteration of conditions for sedimentation and influence of light, and to the influx of temporary pollutions from various sources, such as washings from streets, dung-heaps, etc., which, under some circumstances, pollute more extensively than the regular normal unclean influents, such as sewage. Therefore, in judging of the pollution of a river, the abnormal factor—that is to say, the occasional foul influx after heavy rains—must be eliminated. This is the case when the falling stream, in a

period free from rain, approaches in respect to its depth the normal, when the existing pollution is the normal pollution. Bacteriological examinations at high water, or at low water, at the time of beginning rise, or at the time of local rains without rise, may lead to gross errors, and are, in consequence, worthless for the estimation of the normal pollution. At points where considerable pollution by organic matter is observed, the number of organisms is largely dependent on the temperature, which, however, has no marked influence where their number is small. With rising water, the differences in the pollution at single points, which stand out sharply in comparison with the normal pollution, may to a greater or less extent disappear, and thus the influence of polluted influents and of the self-purification of a river may be more or less hidden.

[From a practical sanitary standpoint, the nature of the occasional and constant polluting influents is of much greater importance than the amount, especially when, as is often the case, two or more polluting influents of widely different character may, by their mutual action on each other, bring about extensive chemical as well as bacteriological purification.]

Influence of Pollution, Temperature, and Ventilation on the Hardness of Ground Water.—DR. GUSTAV VON RIGLER (*Archiv für Hygiene*, xxx. 69), in determining the influence of these factors, used clean sand as a soil and urine mixtures of varying percentage-composition as a polluting agent, and obtained some striking results. The amounts of lime and magnesia in the urine mixtures were determined in each case before the latter were employed. The first series of tests made with distilled water demonstrated that less and less lime and magnesia are washed out of the soil as the exposure continues. Next, using water containing 1 per cent of urine, and, therefore, insignificant amounts of lime and magnesia, it was shown that the hardness of the effluent was increased gradually from ten to forty-eight degrees. Employing 10 per cent. of urine the hardness rose more rapidly from eleven to two hundred and sixty-nine degrees. Adding, from day to day, to the same specimen of sand, mixtures of urine containing first 1 per cent., then 2½, 5, 7, and 10 per cent., it was found that the hardness rose gradually, and then fell, the highest degree attained being with 5 per cent. Thus, excessive pollution reduces the power of the water to withdraw lime and magnesia.

Experiments on the influence of temperature proved that the hardness rises and falls respectively with increased and diminished heat.

Investigating the effect of aëration, he showed that from a soil extensively polluted but well aired, the effluent water rapidly gains, then gradually diminishes in hardness; but that when it is not well aired, the hardness increases slowly but constantly. With extensive pollution and no aëration, the hardness increases gradually for a time, and then gradually falls.

The degree of pollution, the temperature, and the amount of air present exert individually and collectively a great influence on the decomposition processes in the soil, particularly the formation of carbon dioxide, nitric acid, etc., and hence on the solution of the constituents to which hardness is due.

Cause of Death of Fishes in Polluted Rivers.—DR. W. THÖRNER (*Forschungsbericht für Lebensmittel*, 1897, 172) has thrown considerable light on the

cause of death of fishes in polluted streams by his investigation of a case where, in spite of the large extent of pollution present in a river, the water could not be regarded as abnormally foul, and yet large numbers of fish had died. The polluting matters were partly in solution and partly in suspension, and much in a condition for further oxidation. He noticed considerable amounts of ferric hydrate, and its presence suggested that the iron had entered the river in the ferrous form, and had then been oxidized at the expense of the dissolved oxygen of the water. The complete or very large withdrawal of this element by the process of oxidation would naturally render the water incapable of sustaining fish life. Analysis of two samples of the water showed in the one case 57.2 c.c. of total dissolved gases per litre, consisting of 60 per cent. of carbon dioxide and 40 of nitrogen, and in the other 67.2 c.c., consisting of 67.2 per cent. of carbon dioxide and 32.8 of nitrogen. Thus, in neither case was there any oxygen, and hence the death of the fish.

[This explains, in part at least, the disappearance of fish-life in many streams polluted by the sewage of manufacturing establishments, and why the same does not occur where sewage outlets enter the sea, where there is necessarily much aëration.]

Inoculations for Plague.—PROF. HAFFKINE'S report to the Bombay Standing Committee on the results of inoculation for plague gives an account of his work on the inmates of the jail at Byculla. Between January 23d and 29th nine cases occurred, five of which were fatal. At the beginning of the outbreak the population of the jail was 345. On January 30th, prophylactic treatment was applied to 154 inmates who volunteered to be inoculated. One person had a painful gland in the left groin and two others developed painful glands in the left axilla the same evening; the three cases proved fatal. On the following day two cases occurred among the inoculated, and both died. One of the inoculated persons was taken, but recovered. On the second, third, fifth, and sixth days cases occurred among those who had not been inoculated; all fatal. No cases occurred among those who had been inoculated from the first day until the seventh. On the seventh day there were five cases among the non-inoculated, one of which was fatal, and one occurred among the inoculated, but ended in recovery. From January 31st to February 6th twelve cases occurred among the non-inoculated, six of which were fatal, and but two cases among the inoculated, both of which recovered.

Haffkine concludes that the injection of 3 cubic centimetres of prophylactic seems to be sufficient to effect the desired protection. It cannot arrest symptoms already started or that show themselves within a few hours, but the time necessary for it to produce the protective effect is very short.

Transmission of Typhoid Fever through the Air.—The fact that many authorities regard infected air as a common, and, indeed, by some as the principal, medium of transmission of typhoid fever, led DR. EDUARDO GERMANO (*Zeitschrift für Hygiene und Infektionskrankheiten*, xxiv. 403) to institute a series of experiments to determine whether or not this view can be supported by facts. The infected air theory is based on a large number of observations, the value of which must not be overrated, and Germano cites

a number of outbreaks which have been attributed to air-infection. In his experiments he used various kinds of dust and dirt, and from the results obtained he concludes that, contrary to the commonly accepted opinion, the typhoid germ is unable to withstand complete drying, and hence cannot be transmitted to man through dust that is dry enough to be disseminated by air-currents. Infection through the air, especially over a distance of several hundred metres, as is assumed in one of the cases cited (Froidboise), must be regarded as wholly inconceivable. Experiment showed that the typhoid germ can live not only in moist surroundings for a long time, but, under certain circumstances, even in an apparently dry condition. This is possible when it adheres to or is encompassed by matters which themselves contain a certain amount of moisture, such, for instance, as clothing, linen, particles of dirt, and fecal filth. Most of the bacilli die as the drying process progresses, but certain ones are more or less resistant, though not necessarily dangerous on admission to the air, since then complete drying and consequent death occur. They are dangerous only in case of introduction into the system by direct or indirect contact, as from the fingers, food, or eating utensils.

Nevertheless, this very property of retaining vitality for a long time in a half-dry condition must be regarded as an important factor in typhoid infection.

Tubercle Bacilli in Butter.—**PROF. O. ROTH** (*Correspondenzblatt für Schweizer Aerzte*, September 15, 1897) contributes a second paper on the examination of butter for tubercle bacilli. The results of his examinations, reported in 1894, were based wholly on experiments with animals, which procedure requires the expenditure of a great deal of time. This fact led him to attempt the demonstration of the bacilli by cover-glass preparation, and after a number of trials of different methods he found one which commended itself. He employed a butter which he made from milk rich in tubercle bacilli which was derived from a cow with a tuberculous udder. With thorough or even superficial washing with water the bacilli of the butter could be detected in the wash-water, but a surer method was needed, and the following was devised: Two to four grammes of butter are introduced into a test-tube about three-fourths full of water, and kept at about 50° C. in a water-bath until the fat is completely melted, then shaken thoroughly to separate the bacilli from the fat, and inverted and allowed to cool until the fat is again solidified. The water is then poured out and centrifugalized, or allowed to stand for sedimentation in a conical glass or separating funnel. To prevent the increase of other bacteria a little formalin may be added. After centrifugalizing, or after twelve to twenty-four hours' standing, cover-glass preparations of the sediment are made. These are dried by gentle heat, treated with alcohol and ether for the removal of all traces of fat, and then stained. With his tuberculous butter, the bacilli were found in this manner in great numbers. Unfortunately, he could get no more milk in which the bacilli could be directly demonstrated by the microscope, and so could not further investigate the question whether they can be demonstrated in butter made from mixed milk containing only a small proportion of infected milk. Artificially infected milk is not suitable for the study of the question on account of the difficulty of securing uniform distribution of the bacilli.

Coming soon after the publication of Roth's article, is one by DR. LYDIA RUBINOWITSCH (*Zeitschrift für Hygiene und Infektionskrankheiten*, xxvi. 90), bearing directly on the question which Roth could not investigate. She reviews the conflicting evidence in the literature of the subject, and gives the results of her own work on eighty samples of shop-butter, thirty obtained in Berlin and fifty in Philadelphia. The tests were made with animals, using two for each sample. From the whole number of specimens examined not once did she detect any tubercle bacilli which, by culture or pathological behavior in animals, could be pronounced genuine. On the other hand, over a fourth of the samples (28.7 per cent.) produced in guinea-pigs changes which macroscopically and microscopically could deceive one into the belief that they were genuinely tuberculous, but which with more careful examination proved otherwise. Among the Berlin samples ten yielded what seemed to be tubercle bacilli; with one, both animals yielded this bacillus and showed the apparently characteristic changes; with two, one animal did the same and the other died of peritonitis; with three, one animal did the same, and the other yielded only the changes; and with four, one animal did the same, and the others showed no change. The remaining twenty Berlin samples gave the following results: With three, rapid death of both animals from peritonitis; with two, one animal normal, the other showed the resembling pathological changes, but no bacilli; with seven, one died and the other was normal; and with the other eight, both animals remained normal. The fifty Philadelphia samples yielded essentially similar results. In every case where the bacillus like that of tuberculosis was found, careful investigation showed that while it presented many close points of resemblance it was certainly not the same.

The majority of the animals which did not die of peritonitis were killed after from three weeks to over three months from the time of inoculation. A few which showed a considerable loss in weight at the end of the second week were killed and examined at that time.

[The very careful and painstaking work of Dr. Rubinowitsch throws a very decided doubt on the accuracy of the results of those writers who have during the past few years reported the presence of tubercle bacilli in all grades of market butter, and suggests that they had to deal with the same or another bacillus closely resembling that of tuberculosis.]

Cause of Goitre.—SURGEON-LIEUT. E. E. WATERS (*British Medical Journal*, September 11, 1897) communicates some interesting facts concerning the causation of goitre in a district in India 2000 feet above sea-level, which point strongly to an organic rather than a mineral cause. The soil is extremely porous. The water contains no more than a moderate amount of organic matter and mineral constituents, is soft or moderately hard, and, except for minute traces, is free from iron.

The inhabitants, who live under the same climatic conditions, but with different occupations, may be divided into two classes: the native Bhutias and the Sepoy troops from the northwest provinces. The former are carriers and coolies; they are omnivorous, but by reason of poverty, mostly vegetarians. Their chief diseases are goitre, syphilis, and malaria. The temporary inhabitants, the Sepoys, are all vegetarians, and are a healthy lot, practically

free from syphilis, and living under excellent hygienic conditions. They had been in the district twenty months. Examination of 169 Bhutias showed that over 75 per cent. had goitre; nearly 90 per cent. of those over twelve years of age were afflicted. Of 380 Sepoys examined, 54 per cent. had goitre. The Bhutias say that their goitres increase during the rainy season, and this is borne out by the out-patient register and regimental admission-book for 1895. All the British officers, also, during the preceding rainy season had suffered from enlarged thyroids. Their drinking-water was passed through a Pasteur filter; all other water used was taken as tea or soda.

Taking up the several conditions which have been alleged as the cause of the process, he shows them, one after the other, to be not at fault in this particular district. Iron is present in the water only in very minute quantities, and the highest degree of permanent hardness was but three and a half. As to lime as a cause, it appears that many of the Bhutias without goitres are great lime eaters, while of the Sepoys, who never touch it, over 50 per cent. had developed goitres within twenty months after arrival. The theory that the disease is due to carrying heavy loads up and down hills might satisfy in the case of the Bhutias, but not in that of the Sepoys, who, though not carriers, yet have goitre. Further, as to age, it appears that 55 per cent. of the children under twelve had no goitres after living there always, or about the same percentage as did develop them among the Sepoys after a visit of only twenty months. He believes the disease to be due to an organism of an amoeba type, and resembling the malaria organism, with a selective power against the thyroid or its secretion. For a time the system opposes it, and sometimes successfully, but when it overpowers the phagocytic resources of the system, the thyroid enlarges in the effort to combat the poison. Under thyroid feeding (two five-grain tabloids daily) the records show a weekly diminution of a quarter to half an inch in the circumference of the Sepoys' necks, and when the treatment ceases the gland again increases in size. That is to say, additional resisting power is administered in the shape of thyroid tabloids which keep the poison in check and allow the gland to recover its normal size, but on withdrawing the accessory agent there is diminished resistance and again an increase in size.

[Italian investigators advanced, in 1890, a theory that the disease was due to a bacillus, since they had found constant contamination and great bacterial richness in all waters examined in districts where goitre is endemic, and had succeeded in producing goitres experimentally with the water.]

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